

PREscore 2.0 - PRESCORE.TCL File 05/11/93
 NPL Characteristics Data Collection Form
 Garland Landfill Castle Miles - 04/28/94

PAGE: 1

Record Information

1. Site Name: Garland Landfill Castle Miles
 (as entered in CERCLIS)
2. Site CERCLIS Number: TXD980750368
3. Site Reviewer: William Walters
4. Date: April, 26, 1994
5. Site Location: Garland/Dallas, Texas
 (City/County,State)
6. Congressional District: Texas 05
7. Site Coordinates: Single
 Latitude: 32°56'15.0" Longitude: 96°34'48.0"

Site Description

1. Setting: Rural
2. Current Owner: Municipal
3. Current Site Status: Active
4. Years of Operation: Active Site , from and to dates: 10/16/84 - Present
5. How Initially Identified: CERCLA Notification
6. Entity Responsible for Waste Generation:
 - Landfill
 - Municipal
7. Site Activities/Waste Deposition:
 - Municipal Landfill

Waste Description

8. Wastes Deposited or Detected Onsite:

- Municipal Waste

Response Actions

9. Response/Removal Actions:

RCRA Information

10. For All Active Facilities, RCRA Site Status:

- Not Applicable

Demographic Information

11. Workers Present Onsite: Yes

12. Distance to Nearest Non-Worker Individual: > 10 Feet - 1/4 Mile

13. Residential Population Within 1 Mile: 1736.0

14. Residential Population Within 4 Miles: 44766.0

Water Use Information

15. Local Drinking Water Supply Source:

- Surface Water (within 15 mile distance limit)

16. Total Population Served by Local Drinking Water Supply Source: 339394.0

17. Drinking Water Supply System Type for Local Drinking
Water Supply Sources:

- Municipal (Services over 25 People)

18. Surface Water Adjacent to/Draining Site:

- Stream
- Pond

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HRS DOCUMENTATION RECORD
Garland Landfill Castle Miles - 04/28/94

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	Score
Ground Water Migration Pathway Score (Sgw)	0.17
Surface Water Migration Pathway Score (Ssw)	34.38
Soil Exposure Pathway Score (Ss)	0.62
Air Migration Pathway Score (Sa)	6.54

Site Score	17.50
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NOTE

EPA uses the terms "facility," "site," and "release" interchangeably. The term "facility" is broadly defined in CERCLA to include any area where hazardous substances have "come to be located" (CERCLA Section 109(9)), and the listing process is not intended to define or reflect boundaries of such facilities or releases. Site names, and references to specific parcels or properties, are provided for general identification purposes only. Knowledge regarding the extent of sites will be refined as more information is developed during the RI/FS and even during implementation of the remedy.

PREscore 2.0 - PRESCORE.TCL File 05/11/93
GROUND WATER MIGRATION PATHWAY SCORESHEET
Garland Landfill Castle Miles - 04/28/94

PAGE: 2

GROUND WATER MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release to an Aquifer Aquifer: Woodbine Aquifer		
1. Observed Release	550	0
2. Potential to Release		
2a. Containment	10	10
2b. Net Precipitation	10	3
2c. Depth to Aquifer	5	1
2d. Travel Time	35	5
2e. Potential to Release [lines 2a(2b+2c+2d)]	500	90
3. Likelihood of Release	550	90
Waste Characteristics		
4. Toxicity/Mobility	*	1.00E+04
5. Hazardous Waste Quantity	*	100
6. Waste Characteristics	100	32
Targets		
7. Nearest Well	50	0.00E+00
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	0.00E+00
8d. Population (lines 8a+8b+8c)	**	0.00E+00
9. Resources	5	5.00E+00
10. Wellhead Protection Area	20	0.00E+00
11. Targets (lines 7+8d+9+10)	**	5.00E+00
12. Targets (including overlaying aquifers)	**	5.00E+00
13. Aquifer Score	100	0.17
GROUND WATER MIGRATION PATHWAY SCORE (Sgw)	100	0.17

* Maximum value applies to waste characteristics category.
** Maximum value not applicable.

PREscore 2.0 - PRESCORE.TCL File 05/11/93
 SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT SCORESHEET
 Garland Landfill Castle Miles - 04/28/94

PAGE: 3

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors DRINKING WATER THREAT	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release by Overland Flow		
2a. Containment	10	9
2b. Runoff	25	4
2c. Distance to Surface Water	25	6
2d. Potential to Release by Overland Flow [lines 2a(2b+2c)]	500	90
3. Potential to Release by Flood		
3a. Containment (Flood)	10	0
3b. Flood Frequency	50	0
3c. Potential to Release by Flood (lines 3a x 3b)	500	0
4. Potential to Release (lines 2d+3c)	500	90
5. Likelihood of Release	550	90
Waste Characteristics		
6. Toxicity/Persistence	*	1.00E+04
7. Hazardous Waste Quantity	*	100
8. Waste Characteristics	100	32
Targets		
9. Nearest Intake	50	0.00E+00
10. Population		
10a. Level I Concentrations	**	0.00E+00
10b. Level II Concentrations	**	0.00E+00
10c. Potential Contamination	**	5.21E+02
10d. Population (lines 10a+10b+10c)	**	5.21E+02
11. Resources	5	5.00E+00
12. Targets (lines 9+10d+11)	**	5.26E+02
13. DRINKING WATER THREAT SCORE	100	18.36

* Maximum value applies to waste characteristics category.

** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors HUMAN FOOD CHAIN THREAT	Maximum Value	Value Assigned
Likelihood of Release		
14. Likelihood of Release (same as line 5)	550	90
Waste Characteristics		
15. Toxicity/Persistence/Bioaccumulation	*	5.00E+08
16. Hazardous Waste Quantity	*	100
17. Waste Characteristics	1000	320
Targets		
18. Food Chain Individual	50	0.00E+00
19. Population		
19a. Level I Concentrations	**	0.00E+00
19b. Level II Concentrations	**	0.00E+00
19c. Pot. Human Food Chain Contamination	**	3.41E-01
19d. Population (lines 19a+19b+19c)	**	3.41E-01
20. Targets (lines 18+19d)	**	3.41E-01
21. HUMAN FOOD CHAIN THREAT SCORE	100	0.12

* Maximum value applies to waste characteristics category.
 ** Maximum value not applicable.

SURFACE WATER OVERLAND/FLOOD MIGRATION COMPONENT Factor Categories & Factors ENVIRONMENTAL THREAT	Maximum Value	Value Assigned
Likelihood of Release		
22. Likelihood of Release (same as line 5)	550	90
Waste Characteristics		
23. Ecosystem Toxicity/Persistence/Bioacc.	*	5.00E+08
24. Hazardous Waste Quantity	*	100
25. Waste Characteristics	1000	320
Targets		
26. Sensitive Environments		
26a. Level I Concentrations	**	0.00E+00
26b. Level II Concentrations	**	0.00E+00
26c. Potential Contamination	**	3.50E-01
26d. Sensitive Environments (lines 26a+26b+26c)	**	3.50E-01
27. Targets (line 26d)	**	3.50E-01
28. ENVIRONMENTAL THREAT SCORE	60	0.12
29. WATERSHED SCORE	100	18.60
30. SW: OVERLAND/FLOOD COMPONENT SCORE (Sof)	100	18.60

* Maximum value applies to waste characteristics category.
 ** Maximum value not applicable.

SOIL EXPOSURE PATHWAY Factor Categories & Factors RESIDENT POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
1. Likelihood of Exposure	550	550
Waste Characteristics		
2. Toxicity	*	1.00E+04
3. Hazardous Waste Quantity	*	10
4. Waste Characteristics	100	18
Targets		
5. Resident Individual	50	0.00E+00
6. Resident Population		
6a. Level I Concentrations	**	0.00E+00
6b. Level II Concentrations	**	0.00E+00
6c. Resident Population (lines 6a+6b)	**	0.00E+00
7. Workers	15	5.00E+00
8. Resources	5	0.00E+00
9. Terrestrial Sensitive Environments	***	0.00E+00
10. Targets (lines 5+6c+7+8+9)	**	5.00E+00
11. RESIDENT POPULATION THREAT SCORE	**	4.95E+04

* Maximum value applies to waste characteristics category.

** Maximum value not applicable.

*** No specific maximum value applies, see HRS for details.

PREscore 2.0 - PRESCORE.TCL File 05/11/93
 SOIL EXPOSURE PATHWAY SCORESHEET
 Garland Landfill Castle Miles - 04/28/94

PAGE: 7

SOIL EXPOSURE PATHWAY Factor Categories & Factors NEARBY POPULATION THREAT	Maximum Value	Value Assigned
Likelihood of Exposure		
12. Attractiveness/Accessibility	100	5.00E+00
13. Area of Contamination	100	1.00E+02
14. Likelihood of Exposure	500	5.00E+01
Waste Characteristics		
15. Toxicity	*	1.00E+04
16. Hazardous Waste Quantity	*	10
17. Waste Characteristics	100	18
Targets		
18. Nearby Individual	1	1.00E+00
19. Population Within 1 Mile	**	1.00E+00
20. Targets (lines 18+19)	**	2.00E+00
21. NEARBY POPULATION THREAT SCORE	**	1.80E+03
SOIL EXPOSURE PATHWAY SCORE (Ss)	100	0.62

* Maximum value applies to waste characteristics category.

** Maximum value not applicable.

AIR MIGRATION PATHWAY Factor Categories & Factors	Maximum Value	Value Assigned
Likelihood of Release		
1. Observed Release	550	0
2. Potential to Release		
2a. Gas Potential to Release	500	440
2b. Particulate Potential to Release	500	330
2c. Potential to Release	500	440
3. Likelihood of Release	550	440
Waste Characteristics		
4. Toxicity/Mobility	*	1.00E+04
5. Hazardous Waste Quantity	*	100
6. Waste Characteristics	100	32
Targets		
7. Nearest Individual	50	2.00E+01
8. Population		
8a. Level I Concentrations	**	0.00E+00
8b. Level II Concentrations	**	0.00E+00
8c. Potential Contamination	**	1.30E+01
8d. Population (lines 8a+8b+8c)	**	1.30E+01
9. Resources	5	5.00E+00
10. Sensitive Environments		
10a. Actual Contamination	***	0.00E+00
10b. Potential Contamination	***	3.43E-01
10c. Sens. Environments (lines 10a+10b)	***	3.43E-01
11. Targets (lines 7+8d+9+10c)	**	3.83E+01
AIR MIGRATION PATHWAY SCORE (Sa)	100	6.54E+00

* Maximum value applies to waste characteristics category.

** Maximum value not applicable.

*** No specific maximum value applies, see HRS for details.

1. WASTESTREAM QUANTITY SUMMARY TABLE, SOURCE: Castle Miles Landfl

a. Wastestream ID	
b. Hazardous Constituent Quantity (C) (lbs.)	0.00
c. Data Complete?	NO
d. Hazardous Wastestream Quantity (W) (lbs.)	0.00
e. Data Complete?	NO
f. Wastestream Quantity Value (W/5,000)	0.00E+00

WASTE QUANTITY

Garland Landfill Castle Miles - 04/28/94

2. SOURCE HAZARDOUS WASTE QUANTITY FACTOR TABLE

a. Source ID		Castle Miles Landfl	
b. Source Type		Landfill	
c. Secondary Source Type		N.A.	
d. Source Vol. (yd3/gal)	Source Area (ft2)	2585780.00	2613600.00
e. Source Volume/Area Value		1.03E+03	
f. Source Hazardous Constituent Quantity (HCQ) Value (sum of 1b)		0.00E+00	
g. Data Complete?		NO	
h. Source Hazardous Wastestream Quantity (WSQ) Value (sum of 1f)		0.00E+00	
i. Data Complete?		NO	
k. Source Hazardous Waste Quantity (HWQ) Value (2e, 2f, or 2h)		1.03E+03	

Source Hazardous Substances	Depth (feet)	Liquid	Concent.	Units
DDD	< 2	NO	4.9E-03	ppm
PCBs	< 2	NO	4.9E-02	ppm

Documentation for Source Type:

The site is the Castle Drive and Miles Road Landfill currently being operated by the City of Garland. This landfill along with the Castle Drive Landfill comprise the operating landfill for the City of Garland [33]. The Castle Miles portion of the landfill began operation on October 16, 1984 [41], and landfill closure is anticipated in 1999 [33]. A biogas release was observed at the site during the site reconnaissance [3,1; 4,3].

Reference: 3, 4, 33, 41

Documentation for Source Hazardous Substances:

The surface soil sampling investigation [3,2-4; 34] found five contaminants to have elevated concentrations (SS02, SS03, SS06, and SS09) [12,1-26]. These contaminants are manganese, nickel, 4,4'-DDD, endrin ketone and Aroclor-1260 (PCB). Endrin ketone is not listed in the SCDM. Nickel concentrations, although elevated (highest concentration 30.3 ppm) from the background samples which were non-detect (21 ppm), were determined to be within the normal range for Garland Area soils through comparison with data from the Miller Road, Miles Road, and East Garland Road Landfill SIs [35,3-5; 36,3-4; 37,3-5] being conducted concurrently; and through comparison with the general range of nickel concentrations for soils in northeastern Texas (10-30 ppm) [38,4-6]. The only manganese BBC exceedance occurred at an off-site sample (SS09, [12,5]), therefore this manganese exceedance is not considered attributable to the site. Therefore, the only soil contaminants used in this PREscore are 4,4'-DDD and Aroclor-1260. The background samples were collected at sampling locations SS10 and SS11 [12,(4,13,18,19,23,26)] and the BBCs for 4,4'-DDD and Aroclor 1260 are 3.6 and 36 ug/kg, respectively. The only BBC exceedance of 4,4'-DDD (4.9 ug/kg "J") was found at sampling location SS02 [12,22], and the highest BBC exceedance of Aroclor-1260 (49 ug/kg "J") was found at SS06 [12,23] with an additional exceedance found at sampling location SS02. No other soil sampling is known to have been performed at this site [41].

Reference: 3, 12, 34, 35, 36, 37, 38, 41

Documentation for Source Volume:

The estimated quantity of waste disposed in the entire operating landfill as of the end of 1992 is 8,231,399 cubic yds, the proportion of which has been disposed at the Castle Miles portion of the site is not available through landfill records [25]. The Castle Miles portion of the site is approximately 60 acres [26,1], and the total operating landfill is approximately 191 acres [25]. Using the basis that that the amount of waste is based on total area, the estimated quantity of waste for the Castle Miles Landfill is:

$$8,231,399 \text{ cuyds} * 60 \text{ acres}/(191 \text{ acres}) = 2,585,780 \text{ cuyds}$$

Reference: 25, 26

Documentation for Source Area:

Reference 26 (pg 1) notes that the area of the site is 59.92 acres.
This figure is rounded to 60 acres.

$60 \text{ acres} * 43560 \text{ sqft/acre} = 2,613,600 \text{ sqft}$

Reference: 26

WASTE QUANTITY

Garland Landfill Castle Miles - 04/28/94

3. SITE HAZARDOUS WASTE QUANTITY SUMMARY

No.	Source ID	Migration Pathways	Vol. or Area Value (2e)	Constituent or Wastestream Value (2f,2h)	Hazardous Waste Qty. Value (2k)
1	Castle Miles Landfl	GW-SW-SE-A	1.03E+03	0.00E+00	1.03E+03

WASTE QUANTITY

Garland Landfill Castle Miles - 04/28/94

4. PATHWAY HAZARDOUS WASTE QUANTITY AND WASTE CHARACTERISTICS SUMMARY TABLE

Migration Pathway	Contaminant Values	HWQVs*	WCVs**
Ground Water	Toxicity/Mobility 1.00E+04	100	32
SW: Overland Flow, DW	Tox./Persistence 1.00E+04	100	32
SW: Overland Flow, HFC	Tox./Persis./Bioacc. 5.00E+08	100	320
SW: Overland Flow, Env	Etox./Persis./Bioacc. 5.00E+08	100	320
SW: GW to SW, DW	Tox./Persistence 1.00E+04	100	32
SW: GW to SW, HFC	Tox./Persis./Bioacc. 5.00E+04	100	32
SW: GW to SW, Env	Etox./Persis./Bioacc. 2.00E+03	100	18
Soil Exposure:Resident	Toxicity 1.00E+04	10	18
Soil Exposure: Nearby	Toxicity 1.00E+04	10	18
Air	Toxicity/Mobility 1.00E+04	100	32

* Hazardous Waste Quantity Factor Values

** Waste Characteristics Factor Category Values

Note: SW = Surface Water
 GW = Ground Water
 DW = Drinking Water Threat
 HFC = Human Food Chain Threat
 Env = Environmental Threat

No.	Aquifer ID	Type	Overlaying No.	Inter- Connected with	Likelihood of Release	Targets
1	Surficial Aquifer	Non K	0	0	550	0.00E+00
2	Woodbine Aquifer	Non K	0	0	90	5.00E+00

Containment

No.	Source ID	HWQ Value	Containment Value
1	Castle Miles Landfl	1.03E+03	10
=====			
	Containment Factor		10

Documentation for Ground Water Containment, Source Castle Miles Landfl:

There are observed BBC exceedances from ground water monitoring well samples for several TAL metals and TCL volatile organics [12, (7,8,12-14)]; therefore, using Reference 1 (Table 3-2) the ground water pathway containment factor value is determined to be 10.

Reference: 1, 12

Net Precipitation

Net Precipitation (inches)

N.A.

Documentation for Net Precipitation:

The net precipitation factor value of 3 was determined using HRS Figure 3-2 [1].

Reference: 1

Aquifer: Surficial Aquifer

Type of Aquifer: Non Karst

Overlaying Aquifer: 0

Interconnected with: 0

Documentation for Surficial Aquifer Aquifer:

The surficial aquifer exists in the east Garland area as seen during the sampling investigation [3,5-8]. The use of this aquifer is limited to private well users, no municipal wells use this aquifer or deeper aquifers within four miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 3, 16, 27, 28, 29

OBSERVED RELEASE

No.	Well ID	Well Type	Distance (miles)	Level of Contamination
1	Monitoring Well #5	Monitoring Well	0.000	Level I
2	Monitoring Well #4	Monitoring Well	0.000	Level II

Well No.	Hazardous Substance	Concent.	MCL	Cancer	RFD	Units
1	Arsenic	2.2E+01	5.0E+01	2.0E-02	1.1E+01	ppb
1	Barium	8.3E+02	2.0E+03	0.0E+00	2.5E+03	ppb
1	Cobalt	8.5E+00	0.0E+00	0.0E+00	0.0E+00	ppb
1	Dichloroethane, 1,1-	3.6E+01	0.0E+00	0.0E+00	0.0E+00	ppb
1	Dichloroethylene, cis-1,2-	1.1E+02	7.0E+01	0.0E+00	3.5E+02	ppb
1	Manganese	1.6E+03	2.0E+02	0.0E+00	3.5E+03	ppb
1	Trichloroethylene	1.2E+01	5.0E+00	3.2E+00	0.0E+00	ppb
1	Vinyl chloride	2.8E+01	2.0E+00	1.8E-02	0.0E+00	ppb
2	Barium	2.8E+02	2.0E+03	0.0E+00	2.5E+03	ppb
2	Manganese	8.8E+01	2.0E+02	0.0E+00	3.5E+03	ppb

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Observed Release Factor 550

Documentation for Well Monitoring Well #5:

Monitoring Well #5 is just north of the site [34]. The sampling investigation [3,5-8] found exceedances of six TAL metals and four TCL volatile organics (GW13,GW14 [12,(7,14,19,20,23)]). The background sample (GW18) is from Monitoring Well #11 [12,(7,12,15,16,21)]). The following compounds were found to have BBC exceedances at Monitoring Well #5: arsenic (22 ug/l), barium (831 ug/l), cobalt (8.5 ug/l), iron (23,700 ug/l), manganese (1,640 ug/l), thallium (42.9 ug/l "B"), 1,1-dichloroethane (36 ug/l), 1,2-dichloroethene (total) (110 ug/l), trichloroethene (12 ug/l), and vinyl chloride (28 ug/l). The iron exceedance is not evaluated as part of this HRS PREscore.

Reference: 3, 12, 34

Documentation for Well Monitoring Well #4:

Monitoring Well #4 is just beyond the southeast perimeter of the site next to Castle Drive [34]. The sampling investigation [3,5-8] found exceedances of four TAL metals (GW12 [12,(7,13,17,18,22)]). The background ground water monitoring well sample (GW18) is from Monitoring Well #11 [12,(7,12,15,16,22)]). The following compounds were found to have BBC exceedances from Monitoring Well #4 (GW12): barium (284 ug/l), iron (650 ug/l), manganese (88.5 ug/l), and thallium (13.8 ug/l "B"). The iron exceedance is not evaluated as part of this HRS PREscore.

Reference: 3, 12, 34

POTENTIAL TO RELEASE

Containment

Containment Factor 10

Net Precipitation

Net Precipitation Factor 3

Depth to Aquifer

A. Depth of Hazardous Substances 20.00 feet

Documentation for Depth of Hazardous Substances:

The depth of the landfill has been estimated by Ken Smith (Director, City of Garland Sanitation Department) to be 15 to 20 feet below grade [25].

Reference: 25

B. Depth to Aquifer from Surface 23.00 feet

Documentation for Depth to Aquifer from Surface :

There is a three foot clay liner [11]; therefore, the minimum depth to ground water is estimated to be the depth of waste (20 feet[25]) plus the depth of the liner, or 23 feet below the original grade of the site. For comparison, the depth to ground water at the nearby Monitoring Well #5, which is close to the original site grade, was found to be 25.5 feet [3,7].

Reference: 3, 11, 25

C. Depth to Aquifer (B - A) 3.00 feet

Depth to Aquifer Factor 5

Travel Time

Are All Layers Karst? NO

Documentation for Karst Layers:

The surficial aquifer is located in areas of low permeability clays [18,2-5]. The local geologic setting is described as the Ozan Formation ("lower Taylor marl") which has a depth of approximately 500 feet and does not include karst geology [31,2-3].

Reference: 18, 31

Thickness of Layer(s) with Lowest Conductivity 3.00 feet

Documentation for Thickness of Layers with Lowest Conductivity:

The estimated difference in depth of waste and depth of ground water is the 3 foot landfill clay liner [11].

Reference: 11

Hydraulic Conductivity (cm/sec) 1.0E-08

Documentation for Hydraulic Conductivity:

Using Table 3-6 of Reference 1, the landfill's 3 foot clay liner is estimated to have a conductivity of 1E-8 cm/sec.

Reference: 1

Travel Time Factor 35

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Potential to Release Factor	430
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Aquifer: Woodbine Aquifer

Type of Aquifer: Non Karst

Overlaying Aquifer: 0

Interconnected with: 0

Documentation for Woodbine Aquifer Aquifer:

The Woodbine Formation is below the Ozan Formation (500 feet), Austin Chalk (500 feet), and Eagle Ford Group undivided (200-300 feet) [31,2-3]. The only active well, within 4 miles of the site, found in state records [16,1-3; 27,1-2; 28; 29] is a stock watering well in the Woodbine Formation. The Woodbine is noted to be made up of "sandstone, some clay and shale" and it is not Karst [31,2].

Reference: 16, 27, 28, 29, 31

OBSERVED RELEASE

No.	Well ID	Well Type	Distance (miles)	Level of Contamination
- N/A and/or data not specified				

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Observed Release Factor	0
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POTENTIAL TO RELEASE

Containment

Containment Factor 10

Net Precipitation

Net Precipitation Factor 3

Depth to Aquifer

A. Depth of Hazardous Substances 20.00 feet

Documentation for Depth of Hazardous Substances:

The depth of the landfill has been estimated by Ken Smith (Director, City of Garland Sanitation Department) to be 15 to 20 feet below grade [25].

Reference: 25

B. Depth to Aquifer from Surface 1250.00 feet

Documentation for Depth to Aquifer from Surface :

The Woodbine Formation is below the Ozan Formation (500 feet), Austin Chalk (500 feet) and the Eagle Ford Group undivided (200-300 feet) [31,2-3]. Therefore, the total depth to the top of the Woodbine is estimated to be 1250 feet. The stock watering well in the Woodbine is noted to be drilled to a depth of 1388 feet [16,2].

Reference: 16, 31

C. Depth to Aquifer (B - A) 1230.00 feet

Depth to Aquifer Factor 1

Travel Time

Are All Layers Karst? NO

Documentation for Karst Layers:

The geologic layers between the surface and the Woodbine Formation includes the Ozan Formation, Austin Chalk, and the Eagle Ford Group undivided [31,3]. None of these layers is Karst [31,2].

Reference: 31

Thickness of Layer(s) with Lowest Conductivity 750.00 feet

Documentation for Thickness of Layers with Lowest Conductivity:

The Austin Chalk and Eagle Ford Group undivided are the layers with the lowest hydraulic conductivity. The Ozan Formation is clay, silt and sand [31,2] and has an estimated conductivity of 1E-04 cm/sec [1, HRS Table 3-6]. The Austin Chalk is made up of chalk, calcareous clay and thin bentonite beds [31,2] and the Eagle Ford Group undivided is made up of shale, sandstone and limestone [31,2]; both of these layers are estimated to have hydraulic conductivities of 1E-06 cm/sec [1, HRS Table 3-6]. The total thickness of the Austin Chalk (500 feet) and Eagle Ford Group undivided (200-300 feet) is estimated to be 750 feet [31,2].

Reference: 1, 31

Hydraulic Conductivity (cm/sec) 1.0E-06

Documentation for Hydraulic Conductivity:

The Austin Chalk and Eagle Ford Group undivided were estimated to have a hydraulic conductivity of $1E-06$ cm/sec based on HRS Table 3-6 [1]. The Austin Chalk is composed of chalk, calcareous clays, and thin layer of bentonite; and the Eagle Ford Group undivided is composed of shale, sandstone and limestone [31,2].

Reference: 1, 31

Travel Time Factor

5

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Potential to Release Factor	90
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PREscore 2.0 - PRESCORE.TCL File 05/11/93
GROUND WATER PATHWAY WASTE CHARACTERISTICS
Garland Landfill Castle Miles - 04/28/94

PAGE: 25

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 1034.31

Hazardous Substance	Toxicity Value	Mobility Value	Toxicity/ Mobility Value
DDD	100	2.00E-07	2.00E-05
PCBs	10000	2.00E-07	2.00E-03

PREscore 2.0 - PRESCORE.TCL File 05/11/93
GROUND WATER PATHWAY WASTE CHARACTERISTICS
Garland Landfill Castle Miles - 04/28/94

PAGE: 26

Hazardous Substances Found in an Observed Release

Well No.	Observed Release Hazardous Substance	Toxicity Value	Mobility Value	Toxicity/ Mobility Value
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- N/A and/or data not specified

Toxicity/Mobility Value from Source Hazardous Substances:	2.00E-03
Toxicity/Mobility Value from Observed Release Hazardous Substances:	1.00E+04
Toxicity/Mobility Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	1.03E+03
Hazardous Waste Quantity Factor:	100
Waste Characteristics Factor Category:	32

Population by Well

No.	Well ID	Sample Type	Distance (miles)	Level of Contamination	Population
-----	---------	-------------	---------------------	---------------------------	------------

- N/A and/or data not specified

Level I Population Factor: 0.00

Level II Population Factor: 0.00

Potential Contamination by Distance Category

Distance Category (miles)	Population	Value
> 0 to 1/4	0.0	0.00E+00
> 1/4 to 1/2	0.0	0.00E+00
> 1/2 to 1	0.0	0.00E+00
> 1 to 2	0.0	0.00E+00
> 2 to 3	0.0	0.00E+00
> 3 to 4	0.0	0.00E+00

Potential Contamination Factor: 0.000

Documentation for Target Population > 0 to 1/4 mile Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Documentation for Target Population > 1/4 to 1/2 mile Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Documentation for Target Population > 1/2 to 1 mile Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Documentation for Target Population > 1 to 2 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Documentation for Target Population > 2 to 3 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Documentation for Target Population > 3 to 4 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29; 30].

Reference: 16, 27, 28, 29, 30

Nearest Well

Level of Contamination: N.A.

Nearest Well Factor: 0.00E+00

Documentation for Nearest Well:

The nearest known well (b) (6) well at (b) (6) is 0.2 miles south [7,1; 39]. The (b) (6) well is not currently be used for drinking water purposes. However, the cistern has not been plugged and the piping to the house is still functional. The (b) (6) well located approximately 0.7 miles north of the site [7,1] is currently being used for non-drinking domestic purposes (laundry, bathing, dishwashing, etc.) and some inadvertant ingestion is likely [30,1]; therefore this is considered the nearest well.

Reference: 7, 30, 39

Resources

Resource Use: NO

Resource Factor: 0.00E+00

Documentation for Resources:

There is a well that serves stock within four mile of the site [16,1-2; 27,1-2]; however, it is from the deeper Woodbine aquifer. There is no information indicating resource use of the surficial aquifer.

Reference: 16, 27

Wellhead Protection Area

No wellhead protection area

Wellhead Protection Area Factor: 0.00E+00

Documentation for Wellhead Protection Area:

There are no Wellhead Protection Areas within 4 miles of the site
[32].

Reference: 32

Population by Well

No.	Well ID	Sample Type	Distance (miles)	Level of Contamination	Population
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- N/A and/or data not specified

Level I Population Factor: 0.00

Level II Population Factor: 0.00

Potential Contamination by Distance Category

Distance Category (miles)	Population	Value
> 0 to 1/4	0.0	0.00E+00
> 1/4 to 1/2	0.0	0.00E+00
> 1/2 to 1	0.0	0.00E+00
> 1 to 2	0.0	0.00E+00
> 2 to 3	0.0	0.00E+00
> 3 to 4	0.0	0.00E+00

Potential Contamination Factor: 0.000

Documentation for Target Population > 0 to 1/4 mile Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Documentation for Target Population > 1/4 to 1/2 mile Distance Category:

There are no known drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Documentation for Target Population > 1/2 to 1 mile Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Documentation for Target Population > 1 to 2 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Documentation for Target Population > 2 to 3 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Documentation for Target Population > 3 to 4 miles Distance Category:

There are no active drinking water wells known to exist within 4 miles of the site [16,1-3; 27,1-2; 28; 29].

Reference: 16, 27, 28, 29

Nearest Well

Level of Contamination: N.A.

Nearest Well Factor: 0.00E+00

Documentation for Nearest Well:

The (b) (6) well in the overlying surficial aquifer is considered the nearest well, 0.7 miles north of the site [7,1]. This well is actually used for non-drinking domestic purposes (i.e. dishwashing, toilet, etc.) [30]; however, this water could be used for drinking.

Reference: 7, 30

Resources

Resource Use: YES

Resource Factor: 5.00E+00

Documentation for Resources:

A well used for watering stock is located 3.2 miles northwest of the site [27,1-2; 16,1-2; 7,2].

Reference: 7, 16, 27

Wellhead Protection Area

No wellhead protection area

Wellhead Protection Area Factor: 0.00E+00

Documentation for Wellhead Protection Area:

There are no Wellhead Protection Areas within 4 miles of the site [32].

Reference: 32

PREscore 2.0 - PRESCORE.TCL File 05/11/93
 SURFACE WATER PATHWAY SEGMENT SUMMARY
 Garland Landfill Castle Miles - 04/28/94

PAGE: 37

No. Segment ID	Segment Type	Water Type	Start Point (mi)	End Point (mi)	Average Flow (cfs)
1 Rowlett Creek	River	Fresh	-0.40	2.30	106
2 Lake Ray Hubbard	Lake	Fresh	2.30	11.30	822
3 East Fork Trinity	River	Fresh	11.30	15.00	600

Documentation for segment: Rowlett Creek:

The site drains to the west into Rowlett Creek [7,1]. Rowlett Creek is a fresh water stream. Rowlett Creek outlets into Lake Ray Hubbard 2.3 miles downstream of the PPE [7,2]. The overland migration goes southwest from the site through the Castle Drive Landfill portion of the operating landfill. Rowlett Creek has a flow rate of 106 cfs [24,2].

Reference: 7, 24

Documentation for segment: Lake Ray Hubbard:

Rowlett Creek outlets 2.3 miles downstream into Lake Ray Hubbard [7,2], a fresh water lake, that outlets below the dam to the east fork of the Trinity River 11.3 miles from the PPE [8,1-2; 20]. The flow rate of Lake Ray Hubbard has been estimated to be equal to the amount of water leaving the lake through evaporation, water use, and outlet to the east fork of the Trinity River. This estimate is as follows:

$$[(22,745 \text{ acres [19]} * 43560 \text{ sqft/acre} * 56 \text{ in evap./yr [23,2]} / 12 \text{ in/ft}) + (70 \text{ MMgpd DW use [21]} * 365 \text{ d/yr} / 7.48 \text{ gal/cuft} / 3.154\text{E}+7 \text{ sec/yr} + ((600 \text{ cfs} - 33 \text{ cfs}) \text{ outlet [24,3-4]} = 822 \text{ cfs}$$

(note: flow data for the east fork of the Trinity River subtracts flow from Duck Creek (33 cfs) which is downstream of release but upstream of measurement location given in Reference 24, pg. 3)

Reference: 7, 8, 19, 20, 21, 23, 24

Documentation for segment: East Fork Trinity:

Lake Ray Hubbard outlets to the east fork of the Trinity River at the dam 11.3 miles from the PPE. The 15 mile downstream segment ends on the east fork of the Trinity River [8,1-2], which is a fresh water body. The average annual flow rate of the east fork of the Trinity River is 600 cfs [24,3]. The location of this measurement is downstream of Duck Creek which adds an additional 33 cfs [24,4] to that released from Lake Ray Hubbard. Since most of the downstream segment is below Duck Creek the flow rate including Duck Creek is used for this segment.

Reference: 8, 24

OBSERVED RELEASE

No. Sample ID	Sample Type	Distance (miles)	Level of Contamination DW	HFC	Env
---------------	-------------	---------------------	------------------------------	-----	-----

- N/A and/or data not specified

=====

Observed Release Factor	0
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POTENTIAL TO RELEASE

Potential to Release by Overland Flow

Containment

No.	Source ID	HWQ Value	Containment Value
1	Castle Miles Landfl	1.03E+03	9

=====

Containment Factor: 9

Documentation for Overland Flow Containment, Source Castle Miles Landfl:

Currently, there is a maintained engineered 12-18 inch clay cover at the site [15,2]. Therefore, using Reference 1, Table 4-2 the containment factor value for the surface water pathway is 9.

Reference: 1, 15

Distance to Surface Water

Distance to Surface Water: 5280.0 feet
Distance to Surface Water Factor: 6

Documentation for Distance to Surface Water:

The overland drainage from the site travels southwest through the Castle Drive Landfill to Rowlett Creek. The total distance for this overland flow is estimated to be one mile (5280 feet) [7,1].

Reference: 7

Runoff

A. Drainage Area: 60.0 acres

Documentation for Drainage Area:

The area drainage includes only the site as it is on a high point and the landfill is above grade [7,1; 4,(4,6)]. The area of the landfill is 60 acres [26,1].

Reference: 4, 7, 26

B. 2-year, 24-hour Rainfall: 4.0 inches

Documentation for Rainfall:

The 2-yr, 24-hour rainfall (4.0 inches) was determined using a rainfall frequency map [17,2].

Reference: 17

C. Soil Group: D
Fine-textured soils with very low infiltration rates

Documentation for Soil Group:

The native soil classification for this site is low to high permeability clays [18,2-5]. The 12-18 inch clay cover currently applied to the landfill [15,2] is has very low infiltration rates. Therefore, the soils are "very fine textured soil with a very low infiltration rate".

Reference: 15, 18

Runoff Factor: 4

=====

Potential to Release by Overland Flow Factor: 90

Potential to Release by Flood

No. Source ID	HWQ Value	Flood Containment Value	Flood Frequency Value	Potential to Release by Flood
- N/A and/or data not specified				

=====

Potential to Release by Flood Factor: 0

Documentation for Flood Containment, Source Castle Miles Landfl:

The site has no containment structures against flooding [4,1-6].
 Therefore using Reference 1, Table 4-8, the flood containment factor
 value is determined to be 10.

Reference: 1, 4

Documentation for Flood Frequency, Source Castle Miles Landfl:

The site is outside of the 500 year floodplain [13,3-5].

Reference: 13

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 1034.31

Hazardous Substance	Toxicity Value	Persistence Value	Toxicity/ Persistence Value
DDD	100	1.00E+00	1.00E+02
PCBs	10000	1.00E+00	1.00E+04

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Value	Persistence Value	Toxicity/ Persistence Value
---------------	---	-------------------	----------------------	-----------------------------------

- N/A and/or data not specified

Toxicity/Persistence Value from Source Hazardous Substances:	1.00E+04
Toxicity/Persistence Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Persistence Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	1.03E+03
Hazardous Waste Quantity Factor:	100
Waste Characteristics Factor Category:	32

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

Level I Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
--------	--	------------

- N/A and/or data not specified

=====

Population Served by Level I Intakes: 0.0

Level I Population Factor: 0.00E+00

Level II Concentrations

Intake	Distance Along the In-water Segment from the Probable Point of Entry (miles)	Population
--------	--	------------

- N/A and/or data not specified

=====

Population Served by Level II Intakes: 0.0

Level II Population Factor: 0.00E+00

Potential Contamination

Intake ID	Average Annual Flow (cfs)	Population Served
1 Dallas Water Util.	822	339394.0

Documentation for Intake Dallas Water Util.:

The Dallas Water Utilities intake is located on the southwest corner of Lake Ray Hubbard, by the dam [8,2; 20]. The intake was determined to be 11.2 miles from the site PPE [8,1-2]. Dallas Water Utilities mixes water from three lakes prior to distribution to customers. The total population served by the Dallas Water Utilities is 1.6 million [19]. Dallas Water Utilities uses an average of 330 million gallons per day (MMgpd), with Lake Ray Hubbard accounting for an average of 70 MMgpd gallons per day [21]. Therefore, the equivalent population served by the intake on Lake Ray Hubbard is:
 $1.6 \text{ million} * (70 \text{ MMgpd} / 330 \text{ MMgpd}) = 339,394 \text{ persons}$

Reference: 8, 19, 20, 21

Type of Surface Water Body	Total Population	Dilution-Weighted Population
Moderate to Large Stream	339394.0	5214.0
=====		
Dilution-Weighted Population Served by Potentially Contaminated Intakes:	5214.0	
Potential Contamination Factor:		521.0

Nearest Intake

Location of Nearest Drinking Water Intake: Dallas Water Util.
Distance from the Probable Point of Entry: 11.20 miles
Type of Surface Water Body: Lake
Dilution Weight: 0.0100000
Highest Level of Contamination: Potential

Nearest Intake Factor: 0.00

Documentation for Dallas Water Util.:

The Dallas Water Utilities intake is located on the southwest corner of Lake Ray Hubbard, by the dam [8,2; 20]. The intake was determined to be 11.2 miles from the site PPE [8,1-2]. Dallas Water Utilities mixes water from three lakes prior to distribution to customers. The total population served by the Dallas Water Utilities is 1.6 million [19]. Dallas Water Utilities uses an average of 330 million gallons per day (MMgpd), with Lake Ray Hubbard accounting for an average of 70 MMgpd gallons per day [21]. Therefore, the equivalent population served by the intake on Lake Ray Hubbard is:
$$1.6 \text{ million} * (70 \text{ MMgpd} / 330 \text{ MMgpd}) = 339,394 \text{ persons}$$

Reference: 8, 19, 20, 21

Resources

Resource Use: YES

Resource Value: 5.00E+00

Documentation for Resources:

Lake Ray Hubbard is one of the three sources for the water supply for the City of Dallas [19]. Therefore, water from Lake Ray Hubbard is used in commercial food preparation [1].

Reference: 1, 19

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 1034.31

Hazardous Substance	Toxicity Value	Persistence Value	Bio- accum. Value	Toxicity/ Persistence/ Bioaccum. Value
Arsenic	10000	1.00E+00	5.00E+00	5.00E+04
Barium	10	1.00E+00	5.00E-01	5.00E+00
Cobalt	1	1.00E+00	5.00E-01	5.00E-01
DDD	100	1.00E+00	5.00E+04	5.00E+06
Dichloroethane, 1,1-	10	1.00E+00	5.00E+00	5.00E+01
Dichloroethylene, cis-1,2-	100	1.00E+00	5.00E+00	5.00E+02
Manganese	10000	1.00E+00	5.00E-01	5.00E+03
PCBs	10000	1.00E+00	5.00E+04	5.00E+08
Trichloroethylene	10	1.00E+00	5.00E+01	5.00E+02
Vinyl chloride	10000	7.00E-02	5.00E+00	3.50E+03

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Toxicity Value	Persistence Value	Bio- accum. Value	Toxicity/ Persistence/ Bioaccum. Value
---------------	---	-------------------	----------------------	-------------------------	---

- N/A and/or data not specified

Toxicity/Persistence/Bioaccumulation Value from Source Hazardous Substances:	5.00E+08
Toxicity/Persistence/Bioaccumulation Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Persistence/Bioaccumulation Factor:	5.00E+08
Sum of Source Hazardous Waste Quantity Values:	1.03E+03
Hazardous Waste Quantity Factor:	100
Waste Characteristics Factor Category:	320

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

Level I Concentrations

Fishery	Annual Production (pounds)	Human Food Chain Population Value
---------	-------------------------------	--------------------------------------

- N/A and/or data not specified

=====

Sum of Human Food Chain Population Values: 0.00E+00

Level I Concentrations Factor: 0.00E+00

Level II Concentrations

Fishery	Annual Production (pounds)	Human Food Chain Population Value
---------	-------------------------------	--------------------------------------

- N/A and/or data not specified

=====

Sum of Human Food Chain Population Values: 0.00E+00

Level II Concentrations Factor: 0.00E+00

Potential Contamination

Fishery	Annual Production (pounds)	Type of Surface Water Body	Average Annual Flow (cfs)	Pop. Value (Pi)	Dilution Weight (Di)	Pi*Di
2 Lake Ray Hubbard	217693.0	Lake	822	310.0	1.00E-02	3.10E+00
3 East Fork Trinity	10000.0	River	600	31.0	1.00E-02	3.10E-01

=====

Sum of (Pi*Di): 3.41E+00

Potential Human Food Chain Contamination Factor: 3.41E-01

Documentation for Rowlett Creek Fishery:

There are no fishing pressure data available for rivers or streams in the site area, including Rowlett Creek [22]. An engineering estimate of approximately 1% of the fish production estimate of Lake Ray Hubbard will be used as a basis. 217,693 lbs * 0.01 is approximately 2000 lbs. The scoring for fish production is based on orders of magnitude (i.e. 10, 100, 1000, etc.) [1].

Reference: 1, 22

Documentation for Lake Ray Hubbard Fishery:

There are no available fishing pressure data for Lake Ray Hubbard [22]; therefore, data for Lake Lewisville were used as representative for lakes in this region of Texas. For Lake Lewisville, the 1991 fishing pressure was 43 hours/hectare and 0.25 kg/hr of fish caught [22]. Lake Ray Hubbard has a total surface area of 22,745 acres [19], therefore using this fishing pressure data, the equivalent annual estimate of fish caught from Lake Ray Hubbard would be:
 22,745 acres / 2.471 acres/hectares * 43 hrs/hectare * 0.25 kg/hr
 * 2.2 lb/kg = 217693 lbs/yr

Reference: 19, 22

Documentation for East Fork Trinity Fishery:

There are no fishing pressure data available for rivers or streams in the site area, including the east fork of the Trinity River [22]. An engineering estimate of approximately 5% of the fish production estimate of Lake Ray Hubbard will be used as a basis. $217,693 \text{ lbs} * 0.05$ is approximately 10,000 lbs. The scoring for fish production is based on orders of magnitude (i.e. 10, 100, 1000 etc.) [1].

Reference: 1, 22

Food Chain Individual

Location of Nearest Fishery: Lake Ray Hubbard
Distance from the Probable Point of Entry: 2.30 miles
Type of Surface Water Body: Lake
Dilution Weight: 0.0100000
Level of Contamination: Potential

Food Chain Individual Factor: 0.00

Documentation for Lake Ray Hubbard:

Rowlett Creek outlets 2.3 miles downstream into Lake Ray Hubbard [7,2], a fresh water lake, that outlets below the dam to the east fork of the Trinity River 11.3 miles from the PPE [8,1-2; 20]. The flow rate of Lake Ray Hubbard has been estimated to be equal to the amount of water leaving the lake through evaporation, water use, and outlet to the east fork of the Trinity River. This estimate is as follows:

$$[(22,745 \text{ acres [19]} * 43560 \text{ sqft/acre} * 56 \text{ in evap./yr [23,2]} / 12 \text{ in/ft}) + (70 \text{ MMgpd DW use [21]} * 365 \text{ d/yr} / 7.48 \text{ gal/cuft} / 3.154\text{E}+7 \text{ sec/yr}) + ((600 \text{ cfs} - 33 \text{ cfs}) \text{ outlet [24,3-4]}) = 822 \text{ cfs}$$

(note: flow data for the east fork of the Trinity River subtracts flow from Duck Creek (33 cfs) which is downstream of release but upstream of measurement location given in Reference 24, pg. 3)

Reference: 7, 8, 19, 20, 21, 23, 24

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 1034.31

Hazardous Substance	Eco- toxicity Value	Persistence Value	Bio- accum. Value	Ecotoxicity/ Persistence/ Bioaccum. Value
Arsenic	10	1.00E+00	5.00E+01	5.00E+02
Barium	1	1.00E+00	5.00E-01	5.00E-01
Cobalt	0	1.00E+00	5.00E+03	0.00E+00
DDD	10000	1.00E+00	5.00E+04	5.00E+08
Dichloroethane, 1,1-	0	4.00E-01	5.00E+00	0.00E+00
Dichloroethylene, cis-1,2-	0	4.00E-01	5.00E+00	0.00E+00
Manganese	0	1.00E+00	5.00E+04	0.00E+00
PCBs	10000	1.00E+00	5.00E+04	5.00E+08
Trichloroethylene	100	4.00E-01	5.00E+01	2.00E+03
Vinyl chloride	0	7.00E-04	5.00E+00	0.00E+00

Hazardous Substances Found in an Observed Release

Sample No.	Observed Release Hazardous Substance	Eco- toxicity Value	Persistence Value	Bio- accum. Value	Ecotoxicity/ Persistence/ Bioaccum. Value
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- N/A and/or data not specified

Ecotoxicity/Persistence/Bioaccumulation Value from Source Hazardous Substances:	5.00E+08
Ecotoxicity/Persistence/Bioaccumulation Value from Observed Release Hazardous Substances:	0.00E+00
Ecotoxicity/Persistence/Bioaccumulation Factor:	5.00E+08
Sum of Source Hazardous Waste Quantity Values:	1.03E+03
Hazardous Waste Quantity Factor:	100
Waste Characteristics Factor Category:	320

Level I Concentrations

- N/A and/or data not specified

Level II Concentrations

- N/A and/or data not specified

Most Distant Level I Sample

- N/A and/or data not specified

Most Distant Level II Sample

- N/A and/or data not specified

Level I Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
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- N/A and/or data not specified

Sum of Sensitive Environments Values:	0
---------------------------------------	---

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
---------	--	------------------------------

- N/A and/or data not specified

Total Wetlands Frontage:	0.00 Miles	Total Wetlands Value:	0
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=====

Sum of Sensitive Environments Value + Wetlands Value: 0.00E+00

Level I Concentrations Factor: 0.00E+00

Level II Concentrations

Sensitive Environment	Distance from Probable Point of Entry to Sensitive Env. (miles)	Sensitive Environment Value
-----------------------	---	-----------------------------------

- N/A and/or data not specified

Sum of Sensitive Environments Values:	0
---------------------------------------	---

Wetlands

Wetland	Distance from Probable Point of Entry to Wetland (miles)	Wetlands Frontage (miles)
---------	--	------------------------------

- N/A and/or data not specified

Total Wetlands Frontage:	0.00 Miles	Total Wetlands Value:	0
--------------------------	------------	-----------------------	---

=====

Sum of Sensitive Environments Value + Wetlands Value:	0.00E+00
---	----------

Level II Concentrations Factor: 0.00E+00

Potential Contamination

Sensitive Environments

Type of Surface Water Body	Sensitive Environment	Sensitive Environment Value
-------------------------------	-----------------------	-----------------------------------

Wetlands

Type of Surface Water Body	Sensitive Environment	Wetlands Frontage	Wetlands Value
Lake	2 Lake Ray Hubbard	11.30	250
River	3 E. Fork Trinity R	2.70	75

Documentation for Sensitive Environment Lake Ray Hubbard:

No federal or state designated sensitive environments exist near the site [9; 10]. The wetlands delineation was determined using the National Wetlands Inventory maps [8, (1,2,4,5)]. Palustrine emergent (PEM), forested (PFO), scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); and Riverine emergent (REM) habitats are considered wetlands [44, 2-3]. The wetland frontage on Lake Ray Hubbard within the 15 mile target distance limit is estimated to be 11.3 miles [8, (1,2,4,5)].

Reference: 8, 9, 10, 44

Documentation for Sensitive Environment E. Fork Trinity R:

No federal or state designated sensitive environments exist near the site [9; 10]. The wetlands delineation was determined using the National Wetlands Inventory maps [8,(2,5)]. Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); and Riverine emergent (REM) habitats were considered wetlands [44,2-3]. The wetland frontage on the east fork of the Trinity River is estimated to be 2.7 miles prior to the end of the 15 mile downstream segment [8,(2,5)].

Reference: 8, 9, 10, 44

Type of Surface Water Body	Sum of Sens. Environment Values (Sj)	Sum of Wetland Frontage Values (Wj)	Dilution Weight (Dj)	Dj (Wj+Sj)
Moderate to Large Stream	0	350	1.00E-02	3.50E+00

Sum of Dj (Wj+Sj): 3.50E+00
 Sum of Dj (Wj+Sj)/10: 3.50E-01

=====

Potential Contamination Sensitive Environment Factor: 3.50E-01

Likelihood of Exposure

No. Source ID Level of Contamination

1 Castle Miles Landfl Level II

Likelihood of Exposure Factor: 550

Documentation for Area of Contamination, Source Castle Miles Landfl:

The area of contamination for a landfill, if a single sample shows contamination, is the same as the entire area of the landfill [1]. On-site soil samples do show elevated levels of pesticides [12,21-22]. The total area of the landfill is approximately 60 acres [26,1]. 60 acres * 43560 sqft/acre = 2,613,600 sqft.

Reference: 1, 12, 26

Source Hazardous Substance No.	Depth (ft.)	Concent.	Cancer	RFD	Units
1 DDD	< 2	4.9E-03	2.4E+00	0.0E+00	ppm
1 PCBs	< 2	4.9E-02	7.6E-02	0.0E+00	ppm

Documentation for Source Castle Miles Landfl, Contaminants:

The surface soil sampling investigation [3,2-4; 34] found five contaminants to have elevated concentrations (SS02, SS03, SS06, and SS09) [12,1-26]. These contaminants are manganese, nickel, 4,4'-DDD, endrin ketone and Aroclor-1260 (PCB). Endrin ketone is not listed in the SCDM. Nickel concentrations, although elevated (highest concentration 30.3 ppm) from the background samples which were non-detect (21 ppm), were determined to be within the normal range for Garland Area soils through comparison with data from the Miller Road, Miles Road, and East Garland Road Landfill SIs [35,3-5; 36,3-4; 37,3-5] being conducted concurrently; and through comparison with the general range of nickel concentrations for soils in northeastern Texas (10-30 ppm) [38,4-6]. The only manganese BBC exceedance occurred at an off-site sample (SS09, [12,5]), therefore this manganese exceedance is not considered attributable to the

site. Therefore, the only soil contaminants used in this PREscore are 4,4'-DDD and Aroclor-1260. The background samples were collected at sampling locations SS10 and SS11 [12, (4,13,18,19,23,26] and the BBCs for 4,4'-DDD and Aroclor 1260 are 3.6 and 36 ug/kg, respectively. The only BBC exceedance of 4,4'-DDD (4.9 ug/kg "J") was found at sampling location SS02 [12,22], and the highest BBC exceedance of Aroclor-1260 (49 ug/kg "J") was found at SS06 [12,23] with an additional exceedance found at sampling location SS02. No other soil sampling is known to have been performed at this site [41].

Reference: 3, 12, 34, 35, 36, 37, 38, 41

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 76.87

Hazardous Substance	Toxicity Value
DDD	100
PCBs	10000

Toxicity Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	7.69E+01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

Targets

Level I Population: 0.0 Value: 0.00

Documentation for Level I Population:

There are no residents within 200 feet of the site [3,1; 7; 34].

Reference: 3, 7, 34

Level II Population: 0.0 Value: 0.00

Documentation for Level II Population:

There are no residents within 200 feet of the site [3,1; 7; 34].

Reference: 3, 7, 34

Workers: 10.0 Value: 5.00

Documentation for Workers:

The operating landfill employees a total of 10 on-site workers [14,2-3]. There are no other businesses within 200 feet of the site [3,1].

Reference: 3, 14

Resident Individual:	Potentia	Value:	0.00
Resources:	NO	Value:	0.00

Documentation for Resources:

The site is part of the operating landfill for the City of Garland,
it has no current resource uses [4,1-6].

Reference: 4

Terrestrial Sensitive Environment	Value
-----------------------------------	-------

- N/A and/or data not specified

=====

Terrestrial Sensitive Environments Factor: 0.00

Documentation for Terrestrial Environment :

There are no terrestrial sensitive environments located within 4
miles of the site [9; 10].

Reference: 9, 10

Likelihood of Exposure

No.	Source ID	Level of Contamination	Attractiveness/Accessibility	Area of Contam. (sq. feet)
1	Castle Miles Landfl	Level II	5	2613600
Highest Attractiveness/Accessibility Value:				5
Sum of Eligible Areas Of Contamination (sq. feet):				2613600
Area of Contamination Value: 100				

Likelihood of Exposure Factor Category: 50

Documentation for Attractiveness/Accessibility, Source Castle Miles Landfl:

The site is fenced and access is restricted through the main gate of the landfill [14,4]. Using Table 5-6 of Reference 1 the attractiveness/accessibility category is determined to be "Area of observed contamination is surrounded by a maintained fence", which has a value of 5.

Reference: 1, 14

Source No.	Hazardous Substance	Depth (ft.)	Concent.	Cancer	RFD	Units
1	DDD	< 2	4.9E-03	2.4E+00	0.0E+00	ppm
1	PCBs	< 2	4.9E-02	7.6E-02	0.0E+00	ppm

Documentation for Source Castle Miles Landfl, Contaminants:

The surface soil sampling investigation [3,2-4; 34] found five contaminants to have elevated concentrations (SS02, SS03, SS06, and SS09) [12,1-26]. These contaminants are manganese, nickel, 4,4'-DDD, endrin ketone and Aroclor-1260 (PCB). Endrin ketone is not listed in the SCDM. Nickel concentrations, although elevated (highest concentration 30.3 ppm) from the background samples which were non-detect (21 ppm), were determined to be within the normal range for Garland Area soils through comparison with data from the Miller Road, Miles Road, and East Garland Road Landfill SIs [35,3-5; 36,3-4; 37,3-5] being conducted concurrently; and through comparison

with the general range of nickel concentrations for soils in northeastern Texas (10-30 ppm) [38,4-6]. The only manganese BBC exceedance occurred at an off-site sample (SS09, [12,5]), therefore this manganese exceedance is not considered attributable to the site. Therefore, the only soil contaminants used in this PREscore are 4,4'-DDD and Aroclor-1260. The background samples were collected at sampling locations SS10 and SS11 [12,(4,13,18,19,23,26] and the BBCs for 4,4'-DDD and Aroclor 1260 are 3.6 and 36 ug/kg, respectively. The only BBC exceedance of 4,4'-DDD (4.9 ug/kg "J") was found at sampling location SS02 [12,22], and the highest BBC exceedance of Aroclor-1260 (49 ug/kg "J") was found at SS06 [12,23] with an additional exceedance found at sampling location SS02. No other soil sampling is known to have been performed at this site [41].

Reference: 3, 12, 34, 35, 36, 37, 38, 41

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 76.87

Hazardous Substance	Toxicity Value
DDD	100
PCBs	10000

Toxicity Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	7.69E+01
Hazardous Waste Quantity Factor:	10
Waste Characteristics Factor Category:	18

Nearby Individual

Population within 1/4 mile: 15.0

Nearby Individual Value: 1.0

Population Within 1 Mile

Travel Distance Category	Number of People	Value
> 0 to 1/4 mile	15.0	0.0
> 1/4 to 1/2 mile	211.0	0.2
> 1/2 to 1 mile	1510.0	1.0
Population Within 1 Mile Factor:		1.0

Documentation for Population > 0 to 1/4 mile Distance Category:

The number of houses within 1/4 mile of the site is estimated to be 5 [3,1]. This estimate was performed by a drive by count during the site reconnaissance. The population density for the City of Garland is 3.01 persons per household [5,2]. Therefore the population residing within 1/4 mile of the site is $5 * 3.01 = 15$.

Reference: 3, 5

Documentation for Population > 1/4 to 1/2 mile Distance Category:

The population for the 1/4-1/2 mile ring surrounding the site was estimated by linearly interpolating between the population density counted for the 1/4 mile ring [3,1] and that given for the 1-2 mile ring by GEMS [6,2]. This linear interpolation uses two intervals between these known rings (1/4-1/2 & 1/2-1). The population is estimated as follows:

$$\left[\frac{15 \text{ persons}}{(3.14 * (1/4)^2)} + \frac{(-15 \text{ persons})}{(3.14 * (1/4)^2)} + 8712 \text{ persons} \right] / (2^2 - 1^2) = 359 \text{ persons/square mile}$$

$$359 \text{ persons/square mile} * 3.14 * ((1/2)^2 - (1/4)^2) = 211 \text{ persons in the 1/4 to 1/2 mile ring.}$$

Reference: 3, 6

Documentation for Population > 1/2 to 1 mile Distance Category:

The population in the 1/2-1 mile ring surrounding the site is estimated by linearly interpolating between the population density counted for the 1/4 mile ring [3,1] and that given for the 1-2 mile ring by GEMS [6,2]. This linear interpolation uses two intervals between these known rings (1/4-1/2 & 1/2-1). The population is estimated as follows:

$$\left[\frac{15 \text{ persons}}{3.14 * (1/4)^2} + \frac{(-15 \text{ persons})}{(3.14 * (1/4)^2 - 8712 \text{ persons})} \right] / (2^2 - 1^2) = 641 \text{ persons/square mile}$$
$$641 \text{ persons/square mile} * 3.14 * (1^2 - (1/2)^2) = 1510 \text{ persons in the } 1/2 \text{ to } 1 \text{ mile ring.}$$

Reference: 3, 6

OBSERVED RELEASE

No. Sample ID	Distance (miles)	Level of Contamination
---------------	---------------------	------------------------

- N/A and/or data not specified

=====

Observed Release Factor: 0

Gas Migration Potential

GAS POTENTIAL TO RELEASE

Source ID	Source Type	Gas Contain. Value (A)	Gas Source Type Value (B)	Gas Migrtn. Potent. Value (C)	Sum (B+C)	Gas Potential to Rel. Value A(B+C)
Castle Miles Landfl	Landfill	10	33	11	44	440

Gas Potential to Release Factor: 440

Documentation for Gas Containment, Source Castle Miles Landfl:

Based on Reference 1, Table 6-3 this site is categorized as "evidence of biogas release", which gives a gas containment factor value of 10. The biogas release was seen during the site reconnaissance [3,1; 4,3].

Reference: 1, 3, 4

Documentation for Source Type, Source Castle Miles Landfl:

The site is the Castle Drive and Miles Road Landfill currently being operated by the City of Garland. This landfill along with the Castle Drive Landfill comprise the operating landfill for the City of Garland [33]. The Castle Miles portion of the landfill began operation on October 16, 1984 [41], and landfill closure is anticipated in 1999 [33]. A biogas release was observed at the site during the site reconnaissance [3,1; 4,3].

Reference: 3, 4, 33, 41

Source: Castle Miles Landfl

Gaseous Hazardous Substance	Hazardous Substance Gas Migration Potential Value
DDD	6
PCBs	11

Average of Gas Migration Potential Value for 3 Hazardous Substances: 8.500
=====

Gas Migration Potential Value From Table 6-7: 11

Particulate Migration Potential

PARTICULATE POTENTIAL TO RELEASE

Source ID	Source Type	Partic. Contain. Value (A)	Partic. Source Type Value (B)	Partic. Migrtn. Potent. Value (C)	Sum (B+C)	Partic. Potential to Rel. Value A(B+C)
Castle Miles Landfl	Landfill	10	22	11	33	330

Particulate Potential to Release Factor: 330

Documentation for Particulate Containment, Source Castle Miles Landfl:

The particulate containment factor for this landfill would be listed as "All situations except those specifically listed below" as given in Table 6-9 of Reference 1. This containment factor value is equal to 10.

Reference: 1

Documentation for Source Type, Source Castle Miles Landfl:

The site is the Castle Drive and Miles Road Landfill currently being operated by the City of Garland. This landfill along with the Castle Drive Landfill comprise the operating landfill for the City of Garland [33]. The Castle Miles portion of the landfill began operation on October 16, 1984 [41], and landfill closure is anticipated in 1999 [33]. A biogas release was observed at the site during the site reconnaissance [3,1; 4,3].

Reference: 3, 4, 33, 41

Documentation for Particulate Migration Potential:

The site is located in northeastern Texas, approximately 10 miles northeast of Dallas. Figure 6-2 of Reference 1 gives the particulate migration factor value for the site area to be 11.

Reference: 1

Source: Castle Miles Landfl

Particulate Hazardous Substance

DDD

PREscore 2.0 - PRESCORE.TCL File 05/11/93
AIR PATHWAY WASTE CHARACTERISTICS
Garland Landfill Castle Miles - 04/28/94

PAGE: 87

Source: 1 Castle Miles Landfl

Source Hazardous Waste Quantity Value: 1034.31

Hazardous Substance	Toxicity Value	Gas Mobility Value	Particulate Mobility Value	Toxicity/ Mobility Value
DDD	100	2.00E-03	8.00E-04	2.00E-01
PCBs	10000	1.00E+00	NA	1.00E+04

Hazardous Substances Found in an Observed Release

Sample Observed Release ID Hazardous Substance	Particulate Toxicity/ Mobility Value	Gas Toxicity/ Mobility Value
---	--	------------------------------------

- N/A and/or data not specified

Documentation for Particulate Mobility:

The site is located in northeastern Texas, approximately 10 miles northeast of Dallas. Figure 6-3 of Reference 1 gives the particulate mobility factor for the site area to be 0.0008.

Reference: 1

Toxicity/Mobility Value from Source Hazardous Substances:	1.00E+04
Toxicity/Mobility Value from Observed Release Hazardous Substances:	0.00E+00
Toxicity/Mobility Factor:	1.00E+04
Sum of Source Hazardous Waste Quantity Values:	1.03E+03
Hazardous Waste Quantity Factor:	100
Waste Characteristics Factor Category:	32

Actual Contamination

No. Sample ID	Distance (miles)	Level of Contamination
---------------	---------------------	------------------------

- N/A and/or data not specified

Potential Contamination

Distance Categories Subject to Potential Contamination	Population	Value
Onsite	0.0	0.0000
> 0 to 1/4 mile	15.0	0.4000
> 1/4 to 1/2 mile	211.0	0.9000
> 1/2 to 1 mile	1510.0	2.6000
> 1 to 2 miles	8712.0	2.7000
> 2 to 3 miles	13717.0	3.8000
> 3 to 4 miles	20601.0	2.3000

Potential Contaminant Factor: 13.0000

Documentation for Population Onsite Distance Category:

No one lives on-site. The site is part of the operating landfill for the City of Garland [4,1-6].

Reference: 4

Documentation for Population > 0 to 1/4 mile Distance Category:

The population determination within 1/4 mile of the site was accomplished through a house count during the site reconnaissance. The total number of houses within 1/4 mile of the site was estimated to be 5 [3,1]. Using a population density of 3.01 persons per

household for the City of Garland [5,2] the population within 1/4 mile of the site was estimated to be $5 \times 3.01 = 15$ persons.

Reference: 3, 5

Documentation for Population > 1/4 to 1/2 mile Distance Category:

The population in the 1/4-1/2 mile ring surrounding the site was estimated by linearly interpolating between the population density counted for the 1/4 mile ring [3,1] and that given for the 1-2 ring by GEMS [6,2]. This linear interpolation uses two intervals between these known rings (1/4-1/2 & 1/2-1). The population is estimated as follows:

$$\left[\frac{15 \text{ persons}}{3.14 \times (1/4)^2} + \frac{(-15 \text{ persons})}{3.14 \times (1/4)^2} + 8712 \text{ persons} \right] / (2^2 - 1^2) = 359 \text{ persons/square mile}$$
$$359 \text{ persons/square mile} \times 3.14 \times ((1/2)^2 - (1/4)^2) = 211 \text{ persons in the } 1/4 \text{ to } 1/2 \text{ mile ring.}$$

Reference: 3, 6

Documentation for Population > 1/2 to 1 mile Distance Category:

The population in the 1/4-1/2 mile ring surrounding the site was estimated by linearly interpolating between the population density counted for the 1/4 mile ring [3,1] and that given for the 1-2 mile ring by GEMS [6,2]. This linear interpolation uses two intervals between these known rings (1/4-1/2 & 1/2-1). The population is estimated as follows:

$$\left[\frac{15 \text{ persons}}{3.14 \times (1/4)^2} + \frac{(-15 \text{ persons})}{3.14 \times (1/4)^2} + 8712 \text{ persons} \right] \times \frac{2}{3} = 641 \text{ persons/square mile}$$
$$641 \text{ persons/square mile} \times 3.14 \times (1^2 - (1/2)^2) = 1510 \text{ persons in the } 1/2 \text{ to } 1 \text{ mile ring.}$$

Reference: 3, 6

Documentation for Population > 1 to 2 miles Distance Category:

The population for the 1 - 2 mile ring surrounding the site (8712 persons) was determined using GEMS [6,2].

Reference: 6

Documentation for Population > 2 to 3 miles Distance Category:

The population of the 2 - 3 mile ring surrounding the site (13717 persons) was determined using GEMS [6,2].

Reference: 6

Documentation for Population > 3 to 4 miles Distance Category:

The population for the 3 - 4 mile ring surrounding the site (20601 persons) was determined using GEMS [6,2].

Reference: 6

Nearest Individual Factor

Level of Contamination: Potential
Distance in miles: 0 to 1/8

Nearest Individual Value: 20

Documentation for Nearest Individual:

The edge of the closest residence(s) to the site (McCallum residences) are estimated to be 600 feet north of the site (0.11 miles) [7,1; 34].

Reference: 7, 34

Resources

Resource Use: YES

Resource Value: 5

Documentation for Resources:

Commercial agriculture (row crops) exists within 1/2 mile north of the site [3,1; 34].

Reference: 3, 34

Actual Contamination, Sensitive Environments

Sensitive Environment	Distance (miles)	Sensitive Environment Value
- N/A and/or data not specified		

Actual Contamination, Wetlands

Distance Category	Wetland Acreage	Wetland Acreage Value
- N/A and/or data not specified		

=====

Sensitive Environments Actual Contamination Factor: 0.000
(Sum of Sensitive Environments + Wetlands Values)

Potential Contamination, Sensitive Environments

Sensitive Environment	Distance (miles)	Sensitive Environment Value	Distance Weight	Weighted Value/10
- N/A and/or data not specified				

Potential Contamination, Wetlands

Distance Category	Wetland Acreage	Wetland Acreage Value	Distance Weight	Weighted Value/10
> 3 to 4 miles	304.0	350.0	0.0014	0.049
> 2 to 3 miles	325.0	350.0	0.0023	0.081
> 1 to 2 miles	97.0	75.0	0.0051	0.038
> 1/2 to 1 mile	26.0	25.0	0.0160	0.040
> 1/4 to 1/2 mile	1.0	25.0	0.0540	0.135

Total Wetland Acreage: 753.0

Sum of Wetland Weighted Acreage Values/10: 0.343

=====

Sensitive Environment Potential Contamination Factor: 0.343

Documentation for Sensitive Environment Wetlands 1/2-1 Mile:

Wetlands designation was determined through the use of the National Wetlands Inventory Maps [8,1]. Areas designated as Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); Riverine emergent (REM); and combinations of these designations with other designations (e.g. PAB3/SS) were considered wetlands [44,2-3]. Wetland acreage for the various distance rings was determined through the use of planimeter readings and manual area calculations (when areas were too small for the planimeter).

Reference: 8, 44

Documentation for Sensitive Environment Wetlands 1-2 Mile:

Wetlands designation was determined through the use of the National Wetlands Inventory Maps [8,1]. Areas designated as Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); Riverine emergent (REM); and combinations of these designations with other designations (e.g. PAB3/SS) were considered wetlands [44,2-3]. Wetland acreage for the various distance rings was determined through the use of planimeter readings and manual area calculations (when areas were too small for the planimeter).

Reference: 8, 44

Documentation for Sensitive Environment Wetlands 2-3 Mile:

Wetlands designation was determined through the use of the National Wetlands Inventory Maps [8,(1,3)]. Areas designated as Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); Riverine emergent (REM); and combinations of these designations with other designations (e.g. PAB3/SS) were considered wetlands [44,2-3]. Wetland acreage for the various distance rings was determined through the use of planimeter readings and manual area calculations (when areas were too small for the planimeter).

Reference: 8

Documentation for Sensitive Environment Wetlands 3-4 Mile:

Wetlands designation was determined through the use of the National Wetlands Inventory Maps [8,(1,3)]. Areas designated as Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM,L2EM); Riverine emergent (REM); and combinations of these designations with other designations (e.g. PAB3/SS) were considered wetlands [44,2-3]. Wetland acreage for the various distance rings was determined through the use of planimeter readings and manual area calculations (when areas were too small for the planimeter). Other than wetlands there are no federal or state designated sensitive environments within 4 miles of the site [9; 10].

Reference: 8, 9, 10, 44

Documentation for Sensitive Environment Wetlands 1/4-1/2 Mi:

The pond on the south side of the operating landfill is considered to be a potential wetland due to the types of flora surrounding the pond (reeds, other aquatic plants) [40]. This wetland area (0.6 acres [7,1]) is included with other wetland areas found in the 1/4-1/2 mile radius from the site [8,1]. Areas designated as Palustrine emergent (PEM), forested (PFO), and scrub/shrub (PSS); Lacustrine emergent (L1EM, L2EM); Riverine emergent (REM); and combinations of these designations with other designations (e.g. PAB3/SS) were considered wetlands [44,2-3].

Reference: 7, 8, 40, 44

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INDEX

Garland Landfill
Castle Miles
Pre Score

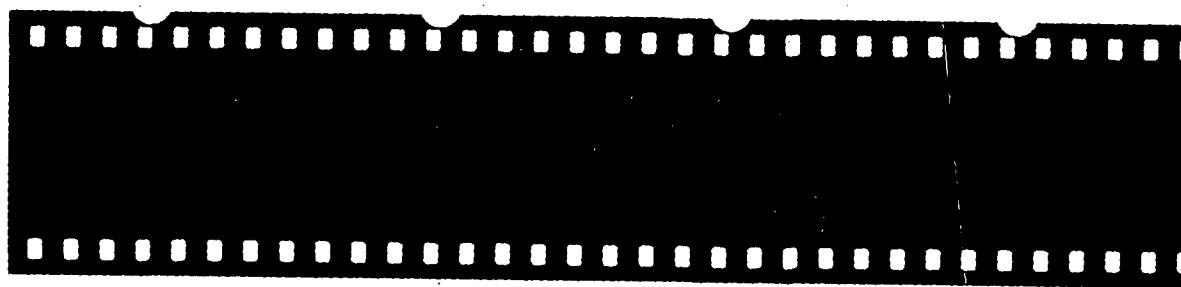
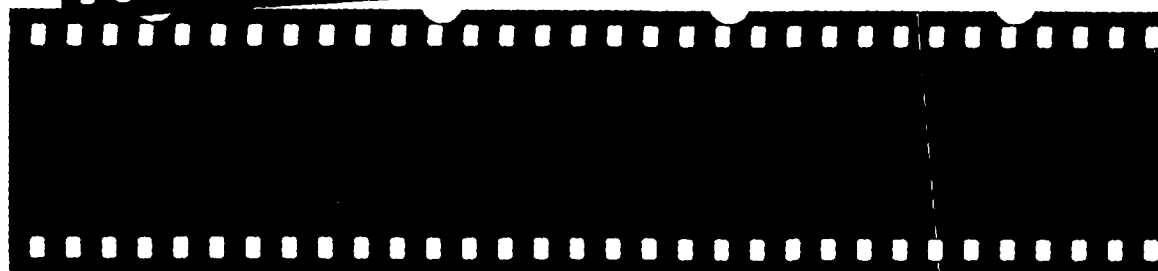
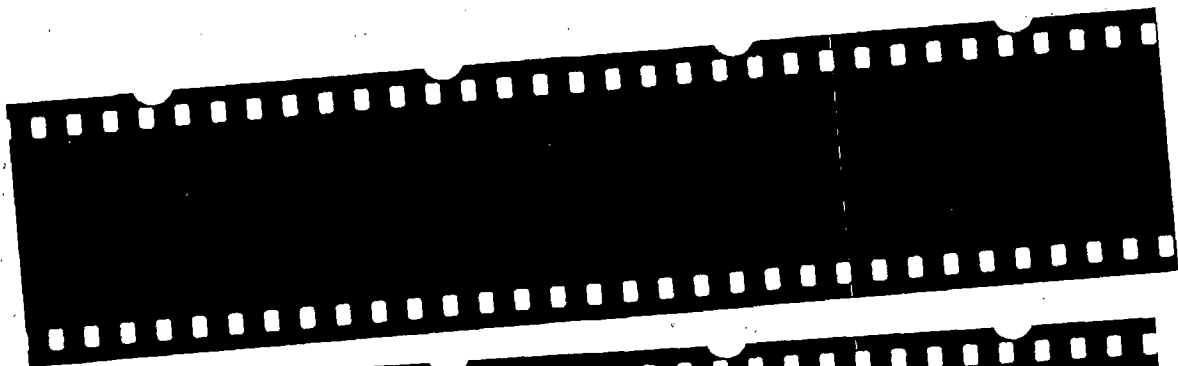
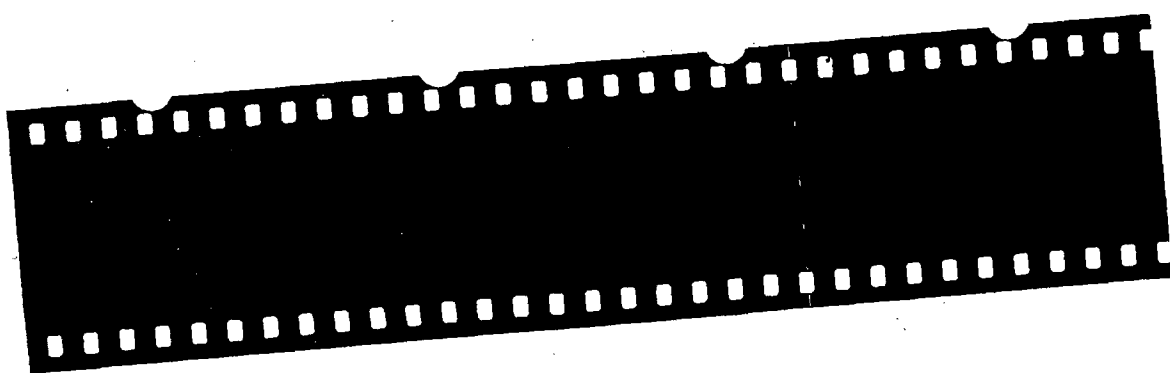
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FLUOR DANIEL

Fluor Daniel Environmental Services, Inc.
3333 Michelson Drive, Irvine, CA 92730

Castle Mikes Landfill Negatives



Reference 1

**EPA Document, Federal Register, Hazard Ranking System;
Final Rule, Part II, 55 FR 51532-51667, December 14, 1990.**

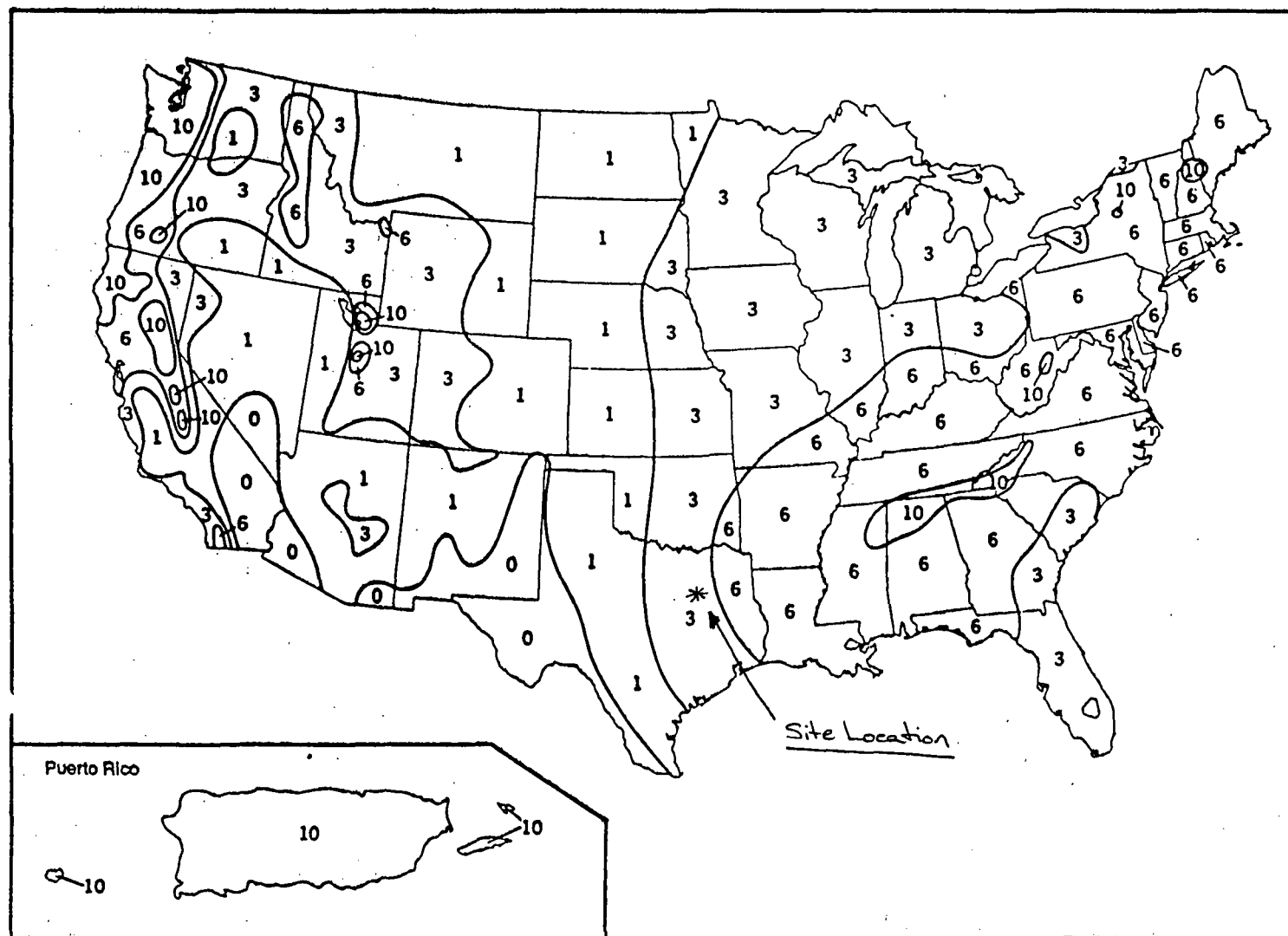


FIGURE 3-2
NET PRECIPITATION FACTOR VALUES

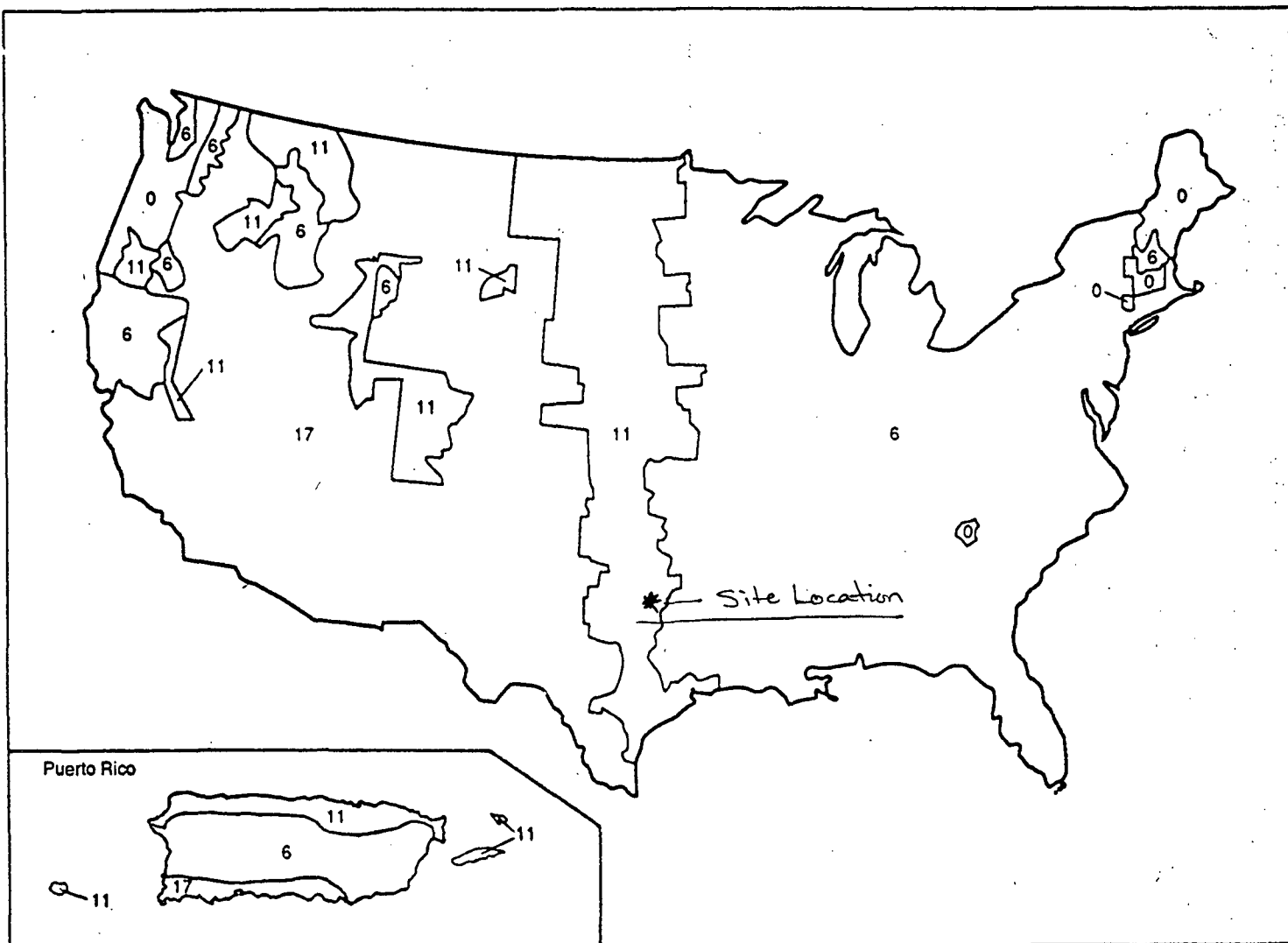
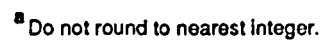


FIGURE 6-2
PARTICULATE MIGRATION POTENTIAL FACTOR VALUES

BILLING CODE 6560-50-C



**FIGURE 6-3
PARTICULATE MOBILITY FACTOR VALUES***

Reference 2

**U.S. Environmental Protection Agency, Superfund Chemical
Data Matrix (SCDM), November 1991.**

Reference 3

**Castle Miles Landfill Field Notebook,
William Walters, Fluor Daniel, May 11,
June 22, 23, & 24, 1993.**

Castle Miles landfill

1

3-1

Photo log

- 1 - Standing water in southeast corner
- 2 - Gas bubbles in south central area

panoramic

- 1 - East Side (Down south) Yellow clay
 - 2 - West Side " Black Clay
- [Also mugshot prior to east side]

Notes

Part of site is more covered than rest (6 inches cover as opposed to 2 feet. This site is not currently accepting trash, the Castle Drive part of this landfill is currently active; However, it will accept more trash in the future.

[Gas Bubbles were observed, & photographed, coming out of a water filled hole on top of this landfill. This section of the landfill is ~~relatively~~ relatively flat & forms a Plateau (Mesa) about 20-30 feet above the surrounding Terrain.

Closest well is $> \frac{1}{2}$ mile & < 1 mile (J.C. Thumble) no other wells can be used for drinking water known within 1 mile.

[A total of 5 residences appear within ~~200~~ 1/4 mile & nothing within 200 ft of fence line except agricultural land.

3-2

Soil Sampling (6/23)

(Note: Field notes are transcribed from notes taken on separate piece of paper as ground water sample team had this field book) [Notes transcribed in chronological order]

Samples # 3 & 4 (dup)

Sample taken near area where gas release observed during site reconnaissance - actual gas leak could not be located.

8:40

Sample Taken 4-6 inches deep

Yellow clay (soft)

strong odor in area & sample was taken

HNU-0

Sample # 1

Sample taken in Hard black clay located in the southwest corner of the landfill

9:15

sample taken 4-6 deep

HNU-0

Sample # 6

Sample taken at base of landfill (south side) near beginning of site drainage feature

9:30

Yellow sandy clay (soft)

Sample Taken 4-6 inches deep

HNU-0

note: between sample # 1 & sample # 6 a hole was found that may have been a gas seep. HNU went below zero when hole was checked (need to determine what could cause such a response)

Soil sampling (cont'd)

Sample #5

Sample taken at the northeast corner of the landfill

Hard yellow clay with black & blue mottling

9:50 sample taken at 2-4 inch depth (trash encountered at depths greater than 4 inches)

HNU - O

Sample #2

Sample taken in the northwest corner of the landfill

Hard yellow clay

10:10 sample taken at 2-4 inch depth (trash encountered at depths greater than 4 inches ~~as was the case~~ w/ #5)

HNU - O

Sample #7

sample taken at base of side hill of landfill where it meets the site access road on the western side of the landfill.

10:45 Hard yellow clay recently recompact (same day as sampled)

Sample taken 3-5 inches deep

HNU - O

Sample #8

Sample taken on western edge of water retention pond.

Soft yellow clay - brown topsoil mixture (sett)

11:05 Sample taken 4-6 inches deep

HNU - O

Soil Sampling (Cont'd)

Sample #9

Taken in area of site drainage south of access road about 1600 feet
between two sections of trees in clear area. drainage
was dry during sampling visit.

11:20 Black clay / Topsoil mixture (medium consistency)

Taken 4-6 inches deep

HNU-0

Sample #10

Taken next to church across the street from site. Sample
location was 50 feet from NE wall of church in area of
dry soil.

12:55 Black Clay (Hard)

taken at 4-6 inch depth

HNU-0

This is a background soil sample.

Receipt for Samples form completed.

Sample #11

Taken 100 feet north of residence that is directly
south of church on other side of castle drive from
the site.

Black clay / Topsoil mixture (medium consistency)

Taken at 4-6 inch depth

HNU-0

13:20

This is a background soil sample

Receipt for Samples form completed.

Sample taken away from garden & fruit trees as
well as septic line to minimize contamination from
pesticides / organics.

Notes 6-22-92

3-5

Purging was completed by Reed Engineering Rep on 6/21/92

11:20

Began sampling well #6

pH

Sample GW - #19

Cond.

Temp

Photo ~~not~~ ^{for} KW

No Photo

Sample completed at 11:39

- Sample was not completed due to the well
not developing(Monica Kelly of Reed Eng. noted that 4 gallons were purged)
dry

12:47

mw # 11

photo ~~not~~ ^{for} KW ^{for} 2

pH = 7.25

GW Sample #16

Depth to Surf = 26.76'

Cond. = 160 x 1000

Total Depth = 33'

Temp = 73.1

Sample collected at 1:45

Purge 6/21/92 by Reed Eng. Rep.

(Monica Kelly of Reed Eng. noted that 7.5 gallons was purged - dry)

1:55

mw # 2

Photo ~~not~~ ^{for} KW ^{for} 2

pH = 6.85

Depth to Surf = 17'

Cond. 6.68 x 100

Total Depth = 47.3'

Temp = 80.4

Sample collected at 2:30

Purged 6/21/92 by Reed Eng. Rep.

(Monica Kelly of Reed Eng. noted that 30 gallons was purged - dry)

4

3-6

Notes 6-23-93

mw#7 - Began purging at 7:20

Depth to surf. = 4.28

Total = 17.28

Purge Vol: 26 gallons

No HNU detect

~~L-15 - Field Blank LW~~~~Taken @~~

Temp = 73.8

Cond = 8.33 x 100

Samples GW-20 at mw#7. Temp pH: 6.80
at 8:30 - completed at 8:40

photo #3

Note: 1 VOA broke prior to Gubble wrap
sample sent with only 1 VOA VIAL

9:48 mw#1 - Began purging at 9:00

Depth to Surf. 10.41'

Total = 31.57

Purge Volume = 42 gallons

No HNU detects

photo #4

sample GW-17 at mw#1

Temp = 75.5

Sample collect at 10:00

pH = 6.40

Cond = 2.31 x 1000

3,6

10:05 L-15 poured at MW#1
where sample GW-17 was taken

12:15 MW#4 - ^{sample #} GW-12
Depth To surf. - 7.86' pH = 8.62
Total Depth - 47.80' Cond. = 7.48x100
Purge Volume = 78.4 Gallons Temp = 80.2
Sample collected at 1:15

photo # 7

3:35 MW#5 GW-13 & 14 (14 QA/QC sample)
Depth to surface of water 25.5 ft
Total well depth 41.0 feet
pH 6.26
Cond. - 1210 μ S/cm
Temp 83.5
Sample collected at 3:35
[well purged by Reed Engineering Rep 6/23/93
& Doug Cheek of FD Volume purged 30 gallons]

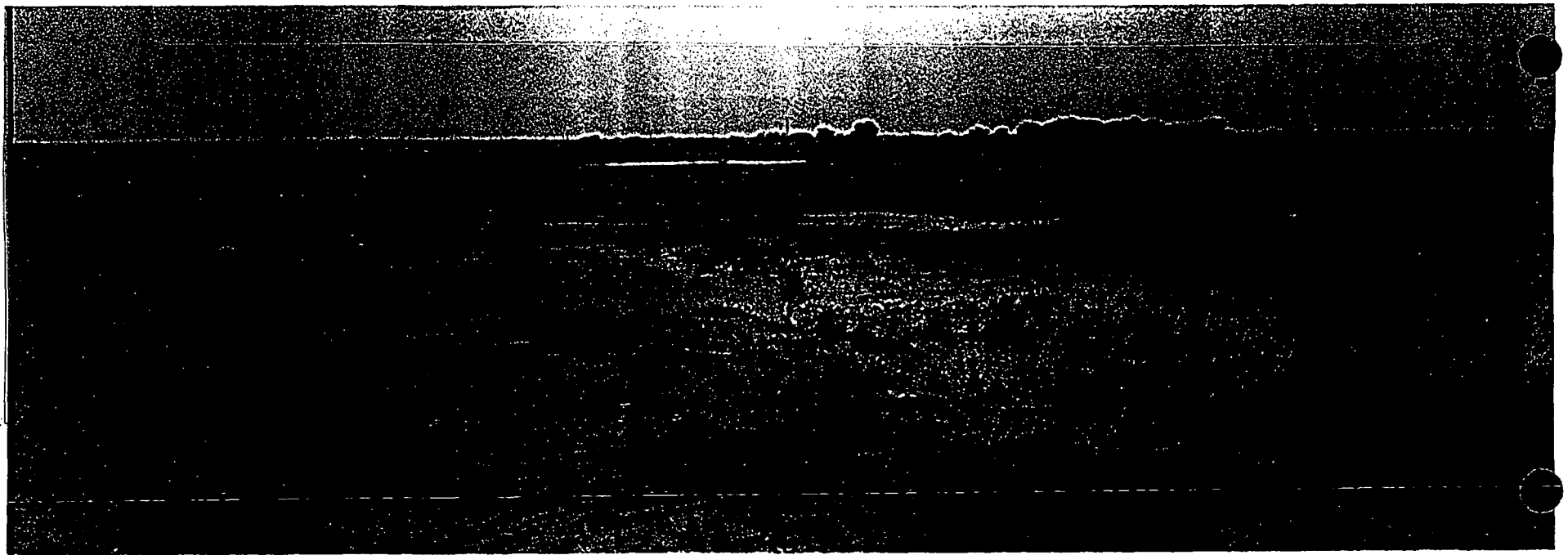
12/24/93

12:40MW-6 - 14.72 feet to surface
15.73 feet to bottomnot enough to sample
well is not viable - sample
deleted1:50mw-7 Resampling 1 VOA that was broken
Sample 20 Took 2 VOA's and will send both

Reference 4

**Castle Miles Landfill Site Reconnaissance Photolog,
May 11, 1993.**

Photo No.
1



Site Name:

Castle Miles Landfill

CERCLIS # TXD980750368

Location:

Garland, Texas

Project #: WA #25-6JZZ

Photographer/Witness

William Walters/Keith Westberry

Date 5/11/93

Time Afternoon

Direction North

Description

Panoramic of the western top of the Castle Miles Landfill showing the area currently covered with the yellow clay.

Photo No.
2



Site Name:
Castle Miles Landfill
CERCLIS # TXD980750368
Location:
Garland, Texas
Project #: WA #25-6JZZ

Photographer/Witness William Walters/Keith Westberry
Date 5/11/93 Time Afternoon Direction North
Description Panoramic of the eastern top of the Castle Miles Landfill showing the
division between the area covered by yellow clay (right) and the area
covered by black clay (left).

Photo No.

3



Site Name:

Castle Miles Landfill

CERCLIS # TXD980750368

Photographer/Witness

William Walters/Keith Westberry

Location:

Date

5/11/93

Time Afternoon

Direction South

Garland, Texas

Description

Photo of observed gas release. Gas bubble is visible in circular area located just below line of standing water in center of photo.

Project #:

WA #25-6JZZ

Photo No.

4



Page 3

Of 6

Photographer/Witness

William Walters/Keith Westberry

Date

5/11/93

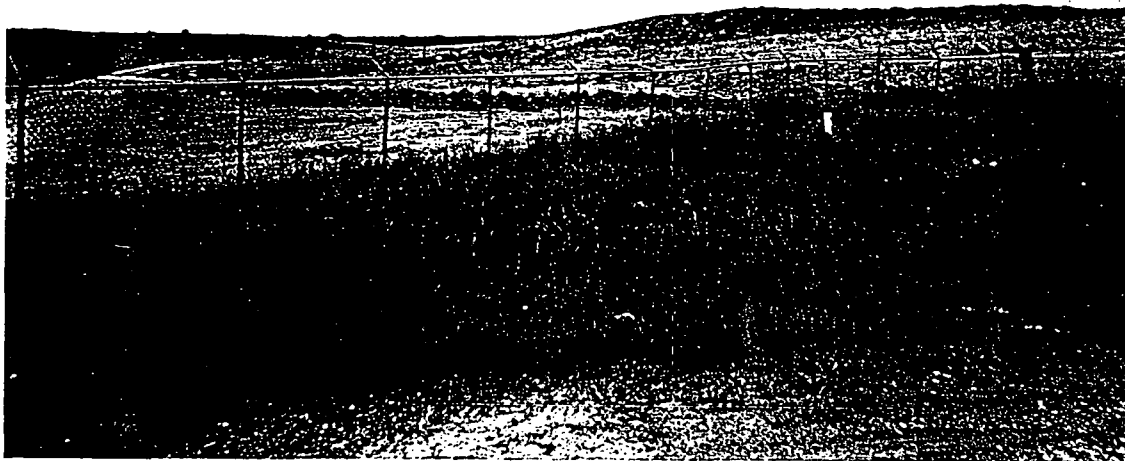
Time Morning

Direction South

Description

Photo of standing water in southeast corner of the top of the landfill.

Photo No.
5



Site Name:
Castle Miles Landfill

CERCLIS #	TXD980750368	Photographer/Witness	William Walters/Keith Westberry	
Location:		Date	5/11/93	Time Afternoon Direction Southwest
Garland, Texas		Description	Photo of monitoring well number 5. Castle Miles Landfill is on extreme left of photo. Photo taken from Miles Road.	
Project #:	WA #25-6JZZ			

Photo No.
6



Page 4
Of 6

Photographer/Witness	William Walters/Keith Westberry		
Date	5/11/93	Time Afternoon	Direction Northwest
Description	Photo of monitoring well number 4. Side slope of Castle Miles Landfill and site fence can be seen at top. Photo taken from Castle Drive.		

4-5

Photo No.
7



Site Name:

Castle Miles Landfill

CERCLIS # TXD980750368

Photographer/Witness

William Walters/Keith Westberry

Location:

Date

5/11/93

Time Afternoon

Direction Southwest

Garland, Texas

Description

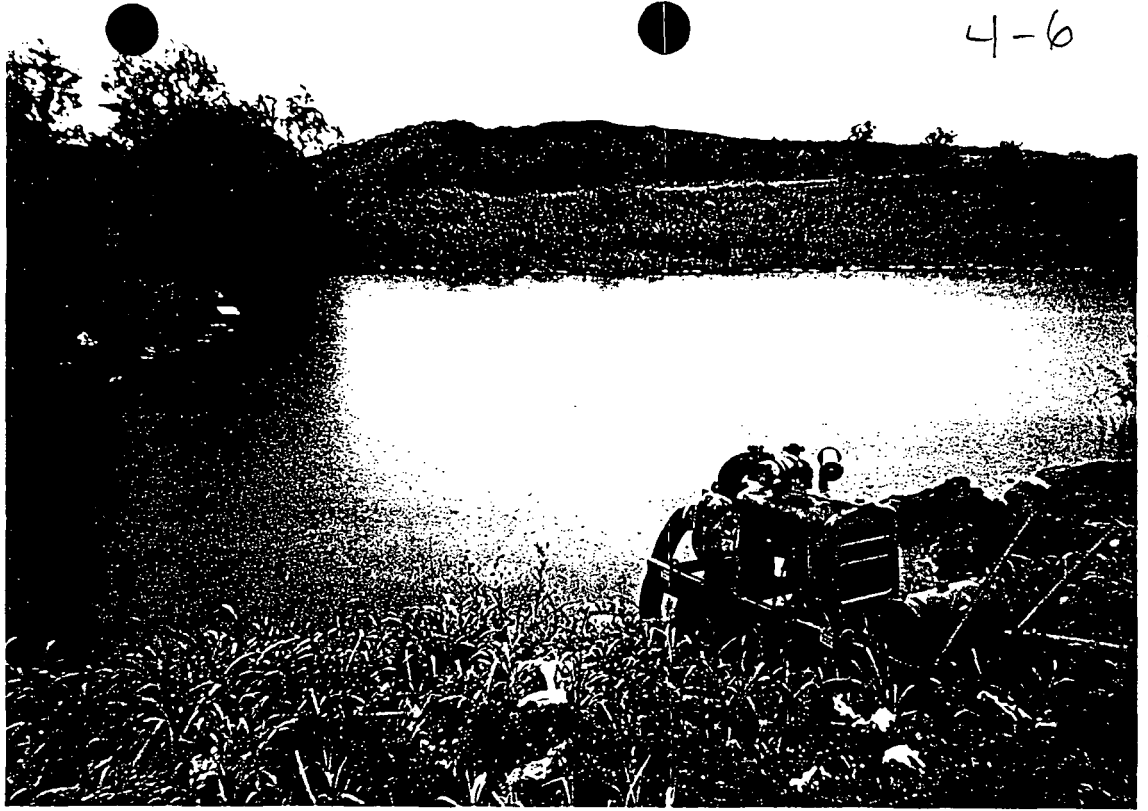
Photo of site drainage that will be sampled as part of this SI. Drainage leads to natural pond. Photo taken from site access road.

Project #:

WA #25-63ZZ

4.5

Photo No.
8



Site Name: Castle Miles Landfill
CERCLIS # TXD980750368 Photographer/Witness William Walters/Keith Westberry
Location: Garland, Texas Date 5/11/93 Time Afternoon Direction Southeast
Description Photo of water retention pond which recieves standing water collected from the site. Side slope of Castle Miles Landfill can be seen in background.
Project #: WA. #25-6JZZ

Reference 5

**County and City Data Book, U.S. Department of Commerce,
Bureau of the Census, 1988.**

County and City Data Book 1988

States

Counties

Cities of 25,000 or More

Places of 2,500 or More



U.S. Department
of Commerce

C. William Verity,
Secretary
Donna C. Tuttle,
Deputy Secretary
Robert Ortnier,
Under Secretary
for Economic Affairs

BUREAU OF
THE CENSUS
John G. Keane,
Director

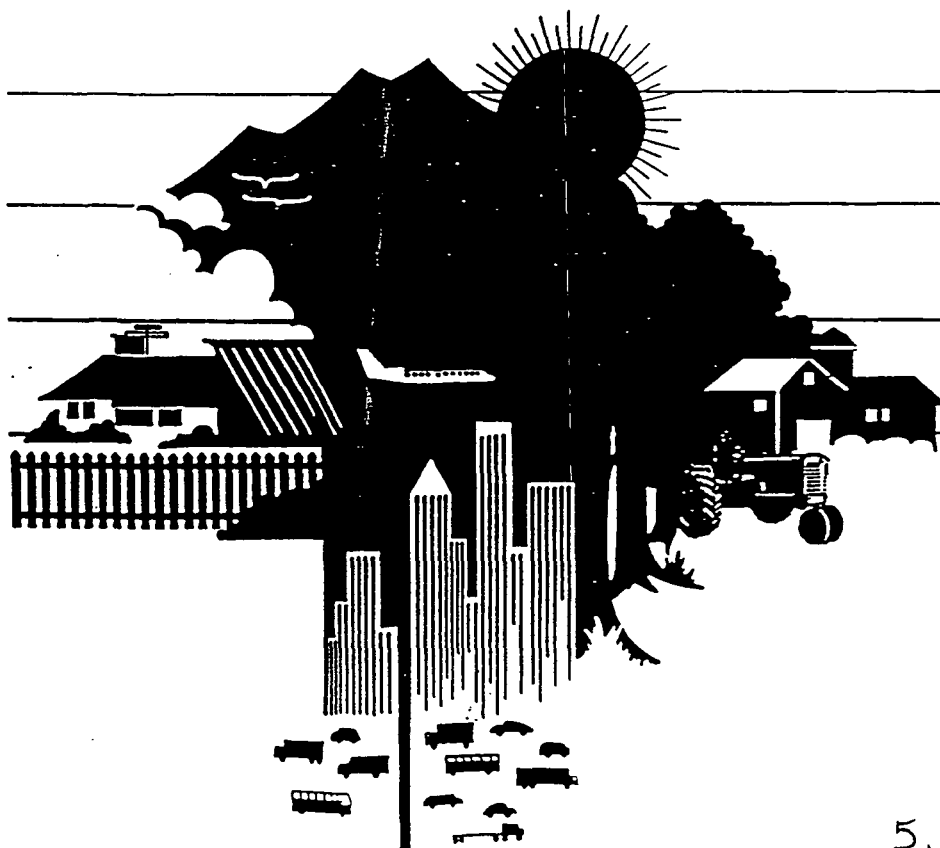


Table C. Cities — Households, Vital Statistics, Hospitals, and Crime

City	Households, 1980				Births, 1984			Deaths, 1984				Hospitals, 1985			Serious crimes known to police, 1985			
	Number	Persons per household	Percent—		Number		Rate ³	Number		Rate		Number	Beds		Number			
			Female family holder ¹	One-person ²	Total	To mothers under 20 yr. old		Total	Infant ⁴	Total ⁵	Infant ⁴		Number	Number	Rate ⁶	Total	Violent ⁷	Rate ⁸
	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
TEXAS—Con.																		
Del Rio	8 724	3.42	11.2	15.9	703	16.4	20.4	231	9	6.7	12.8	2	106	305	1 692	155	4 958	
Denton	17 522	2.36	7.9	30.2	911	14.8	19.8	359	4	7.8	4.4	2	361	654	4 840	356	9 065	
Duncanville	8 834	3.13	8.2	10.3	496	8.5	15.6	155	5	4.9	10.1	—	—	—	1 979	70	6 282	
El Paso	128 187	3.28	13.3	18.9	10 414	14.8	22.5	2 650	100	5.7	9.6	13	2 360	480	33 697	3 662	7 096	
Fort Worth	144 032	2.60	11.9	25.3	9 069	19.3	21.9	4 154	129	10.0	14.2	17	3 029	705	58 858	6 352	13 867	
Galveston	24 013	2.49	14.2	31.5	1 107	18.4	17.7	663	11	10.6	9.9	3	1 288	2 139	6 654	867	9 910	
Garland	45 978	3.01	9.3	13.4	3 246	12.2	20.3	653	19	4.1	5.8	3	358	203	9 209	444	5 614	
Grand Prairie	23 714	2.74	9.6	15.6	1 721	17.7	20.0	448	18	5.2	10.5	2	386	403	7 266	520	8 791	
Haltom City	10 483	2.74	9.2	18.3	411	16.3	13.0	209	3	6.6	7.3	—	—	—	2 962	112	9 065	
Harlingen	13 091	3.23	12.1	18.1	834	15.4	18.0	399	8	7.7	8.6	3	615	1 119	3 882	207	7 656	
Houston	602 696	2.62	11.5	28.7	37 685	16.2	22.1	11 714	449	6.9	11.9	45	13 601	787	155 910	16 461	8 928	
Hurst	11 111	2.81	8.6	15.8	517	11.2	15.0	177	5	5.1	9.7	—	—	—	2 789	169	7 945	
Irving	40 184	2.70	9.4	20.9	2 403	13.7	20.0	690	25	6.7	10.4	2	281	219	12 025	845	8 783	
Killeen	16 672	2.77	8.5	17.1	2 224	18.0	40.1	235	27	4.2	12.1	1	78	131	4 137	277	7 637	
Kingsville	9 151	3.00	9.7	19.7	713	19.6	23.8	172	4	5.7	5.6	1	136	476	1 679	84	5 246	
Laredo	23 903	3.79	15.9	14.1	2 566	13.6	23.6	586	23	5.4	9.0	3	446	381	7 978	600	7 170	
Longview	22 934	2.68	9.3	22.5	1 253	15.6	17.1	600	14	8.2	11.2	2	363	491	5 139	265	6 948	
Lubbock	60 783	2.70	8.5	22.9	3 581	17.0	20.1	1 179	44	6.6	12.3	9	1 550	832	17 579	1 522	9 617	
Lufkin	10 180	2.75	10.2	23.3	660	21.4	21.6	369	10	10.1	15.2	2	371	1 156	2 005	126	6 212	
McAllen	19 448	3.38	11.6	16.5	1 585	10.4	20.6	463	25	6.0	15.8	4	543	652	5 480	257	7 098	
Mesquite	21 368	3.11	10.2	11.2	1 666	12.8	21.6	366	15	5.0	9.0	3	409	461	6 790	449	8 905	
Midland	25 558	2.74	7.7	21.7	1 822	12.3	19.8	658	16	5.7	8.3	3	305	311	4 487	459	4 975	
Mineral Wells	9 268	2.47	10.8	27.1	396	18.4	13.8	220	2	8.0	5.1	2	348	1 228	1 311	129	4 359	
North Richland Hills	10 600	2.90	7.1	13.8	430	11.4	11.6	141	4	3.8	9.3	1	160	364	2 489	112	7 041	
Odessa	32 139	2.78	8.1	20.4	2 398	17.9	22.1	623	26	5.7	10.8	2	470	464	9 483	367	8 522	
Paris	9 823	2.50	12.0	28.8	410	24.1	15.7	352	3	13.4	7.3	2	367	1 477	3 180	391	11 647	
Pasadena	38 750	2.88	8.5	17.8	2 338	16.1	18.6	631	22	5.3	9.4	4	805	682	6 803	706	5 569	
Plano	22 221	3.24	8.6	9.9	1 709	5.7	18.3	314	9	3.4	8.3	1	233	210	5 539	151	6 141	
Port Arthur	22 130	2.74	12.3	24.0	1 103	17.8	17.2	725	11	11.3	10.0	2	501	803	3 157	305	4 524	
Richardson	24 067	2.99	8.9	12.4	1 008	5.1	13.1	303	6	3.9	5.0	1	242	310	4 343	119	6 328	
San Angelo	26 578	2.64	9.2	24.1	1 641	17.5	19.5	720	13	8.5	7.9	4	787	912	5 416	404	6 381	
San Antonio	258 984	2.97	13.8	22.1	16 638	18.6	20.0	6 408	216	7.8	12.8	23	7 352	804	63 691	5 393	9 687	
Sherman	11 718	2.49	10.1	25.6	581	20.1	18.6	356	3	11.4	5.2	2	368	1 231	2 626	131	7 940	
Temple	16 039	2.55	9.9	27.0	782	16.1	17.4	476	8	10.6	10.2	3	1 792	3 847	2 710	141	6 014	
Texarkana	12 144	2.53	14.7	28.6	573	21.8	17.4	450	13	13.7	22.7	3	573	1 730	2 953	250	8 674	
Texas City	14 045	2.90	10.6	17.7	679	18.3	15.6	335	6	7.7	8.8	2	424	1 004	3 283	195	7 157	
Tyler	26 024	2.64	11.0	24.6	1 354	16.5	18.5	753	21	10.3	15.5	6	968	1 280	7 262	449	9 295	
Victoria	17 220	2.91	9.2	19.6	1 201	17.7	21.8	393	4	7.1	3.3	3	546	964	3 947	328	6 704	
Waco	37 578	2.51	12.2	27.4	2 259	21.3	21.7	1 214	23	11.7	10.2	5	1 580	1 502	9 795	791	9 187	
Wichita Falls	33 647	2.58	9.5	24.5	1 816	14.4	18.4	920	30	9.3	16.5	4	1 136	1 137	8 512	614	8 406	
UTAH																		
Bountiful	448 603	3.20	7.6	17.2	38 299	8.7	23.2	8 997	350	5.4	9.1	47	5 423	326	87 470	4 398	5 317	
Boulder	9 138	3.57	6.7	11.3	625	6.9	18.2	192	5	5.6	8.0	1	128	371	1 242	107	3 488	
Logan	9 291	2.70	6.2	22.9	861	5.9	29.9	164	7	5.7	8.1	1	154	533	897	35	3 009	
Murray	9 109	2.81	8.8	21.7	618	10.5	22.9	160	1	5.9	1.6	1	243	1 024	3 136	142	11 096	
Ogden	23 985	2.62	10.2	26.4	1 566	15.4	23.0	706	23	10.4	14.7	2	550	815	6 322	322	9 071	
Orem	13 955	3.73	7.5	9.5	1 803	6.0	29.6	207	18	3.4	10.0	1	20	32	2 324	26	3 913	
Provo	20 083	3.37	6.4	12.7	2 395	5.0	32.3	352	23	4.7	9.6	2	654	844	2 966	109	3 662	
Salt Lake City	67 676	2.35	9.0	34.2	3 795	10.0	23.0	1 685	43	10.2	11.3	10	2 300	1 452	19 037	1 083	11 593	
Sandy City	12 875	3.82	5.6	6.3	1 382	5.1	21.8	116	8	1.8	5.8	1	50	74	2 495	90	4 162	
West Jordan	6 781	4.01	6.6	5.4	957	6.9	24.6	78	13	2.0	13.6	1	50	113	1 836	119	5 366	
VERMONT																		
Burlington	178 325	2.75	8.8	22.0	8 020	10.0	15.1	4 632	70	8.6	8.7	19	2 657	528	20 801	790	3 688	
.....	13 107	2.44	10.1	30.7	466	12.4	12.3	330	7	8.7	15.0	1	491	1 282	3 976	100	10 217	
VIRGINIA																		
Alexandria	1 863 073	2.77	10.8	20.5	82 719	12.6	14.7	44 310	1 005	7.9	12.1	138	30 096	520	215 634	16 813	3 779	
Blacksburg town	49 004	2.07	9.9	41.3	1 945	8.5	18.2	613	35	7.8	18.0	4	766	711	7 670	802	7 079	
Blacksburg town	9 088	2.43	5.1	21.8	246	9.3	8.1	83	3	2.7	12.2	1	146	481	1 286	25	4 036	
Charlottesville	15 401	2.60	11.7	28.9	580	11.7	14.3	391	7	8.8	12.1	3	1 039	2 528	3 109	221	7 562	
Chesapeake	36 383	3.11	11.9	13.1	2 135	13.5	16.9	886	21	7.0	8.8	1	210	156	5 112	407	4 007	
Danville	17 511	2.55	14.8	25.5	588	17.5	13.2	877	9	12.9	15.3	1	383	857	1 408	63	3 111	
Hampton	41 506	2.83	13.7	18.5	2 119	13.5	18.8	869	30	6.9	14.2	4	1 067	847	7 094	370	6 560	
Lynchburg	23 940	2.60	13.2	24.8	868	15.7	12.9	734	13	10.9	15.0	2	895	1 022	3 220	368	4 725	
Newport News	51 314	2.73	13.6	21.0	2 950	15.2	19.1	1 153	37	7.5	12.5	5	942	583	7 301	757	4 664	

¹No spouse present. ²Householder living alone. ³Per 1,000 resident population estimated as of July 1, 1984. ⁴Deaths of infants under 1 year old. ⁵Deaths of infants under 1 year old per 1,000 live births. ⁶Per 100,000 resident population estimated as of July 1, 1985. ⁷Includes murder and nonnegligent manslaughter, forcible rape, robbery, and aggravated assault. ⁸Per 100,000 resident population estimated for 1985 by the FBI.

Reference 6

**Geographic Exposure Modeling System, Census data for the
Castle Drive and Miles Road Landfill Site, Garland, Texas,
May 13, 1993.**

6-1

COVERAGE

=====

STATE	COUNTY	STATE NAME	COUNTY NAME
48	85	Texas	Collin Co
48	113	Texas	Dallas Co

CENTER POINT AT STATE : 48 Texas
COUNTY : 113 Dallas Co

REGION OF THE COUNTRY

=====

Zipcode found: 75088 at a distance of 4.0 Km

STATE	CITY NAME	FIPSCODE	LATITUDE	LONGITUDE
TX	ROWLETT	48113	32.9033	96.5667

6,1

6-2

CENSUS DATA

=====

Castle Miles Landfill

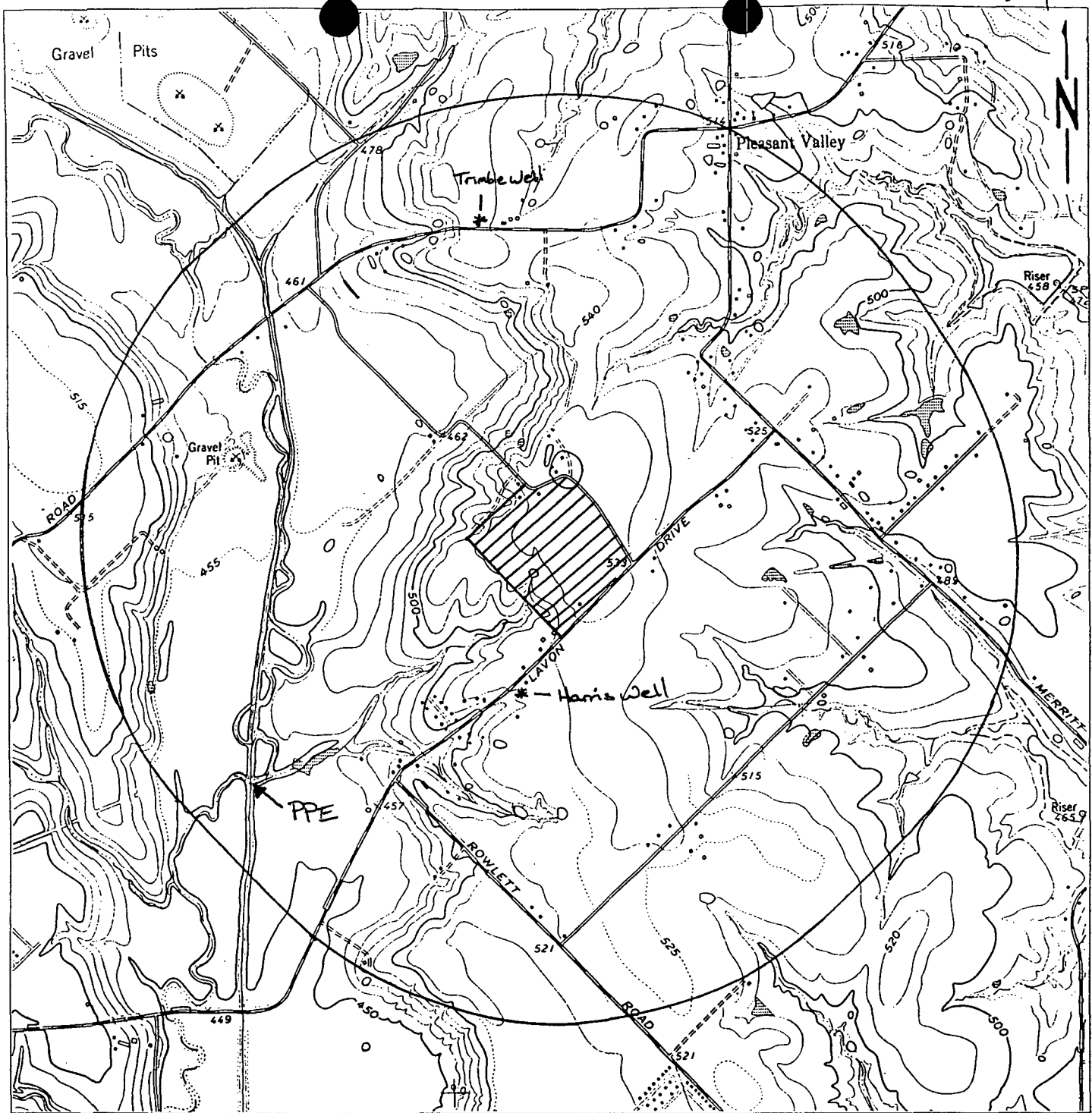
LATITUDE 32:56:15 LONGITUDE 96:34:43 1990 POPULATION

	SECTOR						
KM	0.00-.400	.400-.800	.800-1.60	1.60-3.20	3.20-4.80	4.80-6.40	TOTALS
S 1	0	0	0	0	1844	1200	3044
S 2	0	0	0	2510	1985	0	4495
S 3	0	0	0	0	3151	5413	8564
S 4	0	0	0	6202	6737	13988	26927
RING	0	0	0	<u>8712</u>	<u>13717</u>	<u>20601</u>	43030
TOTALS							

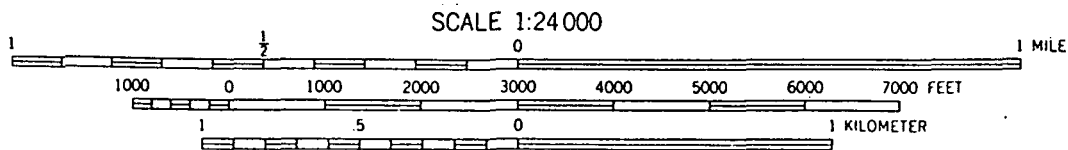
6,2

Reference 7

**U.S. Geological Survey, 7.5 minute topographic map, Rowlett
Tex., 1959 (photorevised 1968 and 1973).**



NOTE: Topographic Map, Rowlett Quadrangle. 1959. Photorevised 1968 and 1973



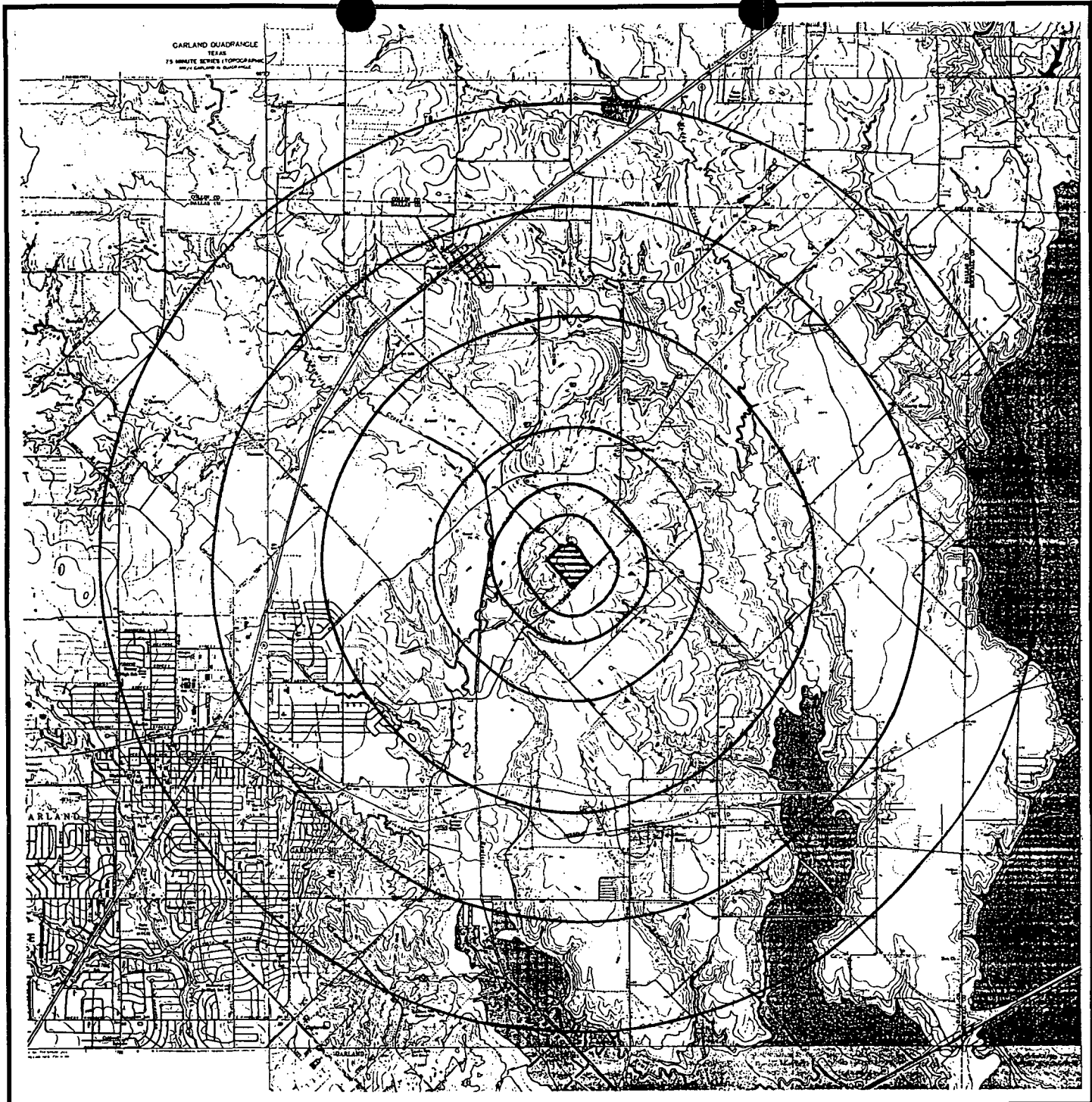
QUADRANGLE LOCATION



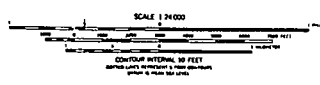
FLUOR DANIEL

Figure 1

Location Map
 Castle Drive & Miles Road Landfill
 Garland, Texas



NOTE: Topographic Maps – Rowlett Quadrangle. 1959. Photorevised 1968 and 1973
– Wylie Quadrangle. 1959. Photorevised 1968 and 1973.
– Garland Quadrangle. 1959. Photorevised 1967 and 1973.



QUADRANGLE LOCATION

Four Mile Radius Map
Castle Drive and Miles Road Landfill
Garland, Texas



FLUOR DANIEL

Figure 4

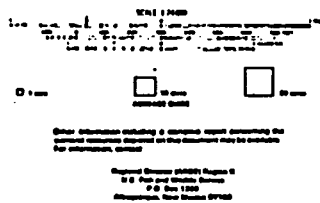
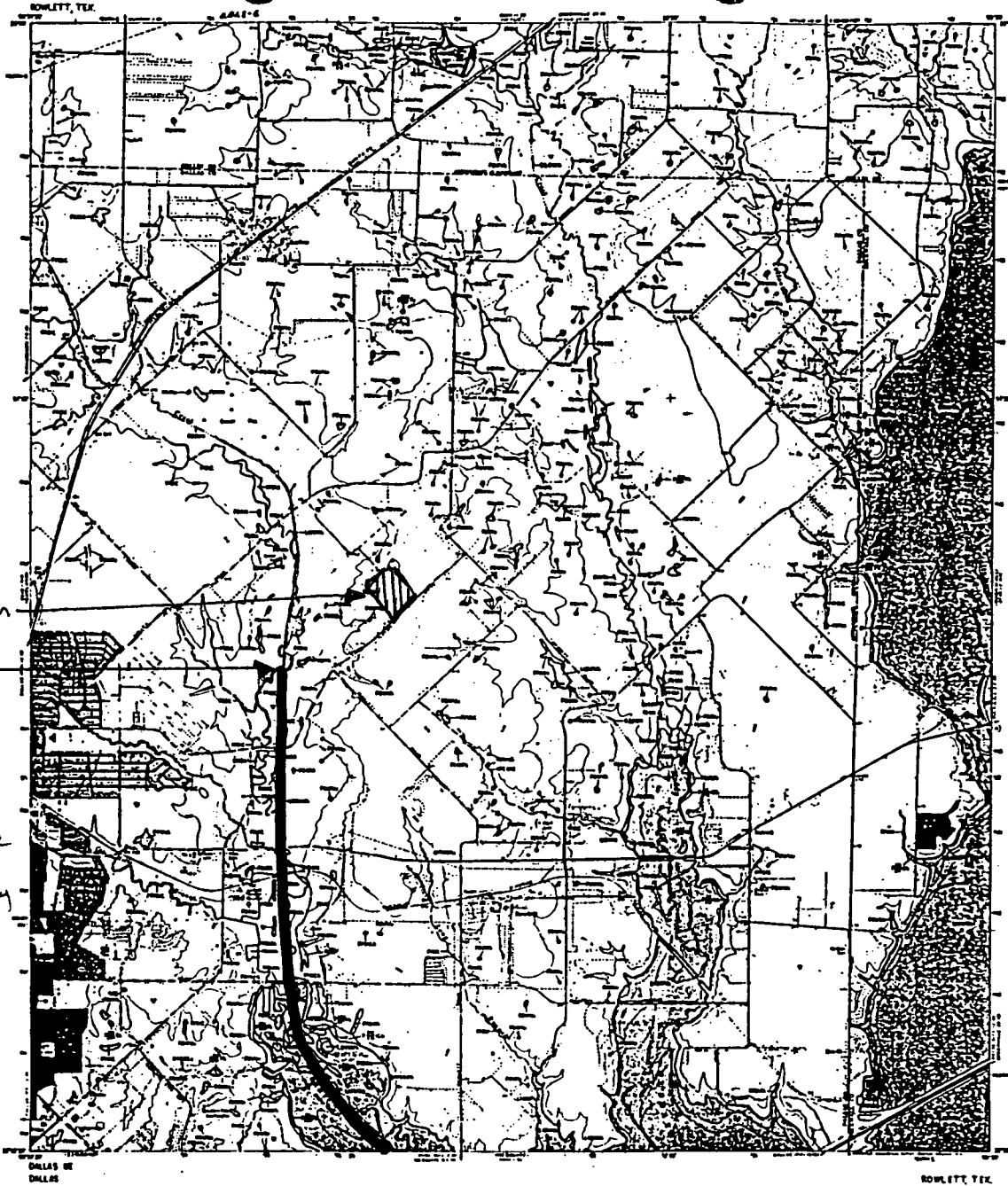
Reference 8

**National Wetlands Inventory Maps, Rowlett, Mesquite,
Garland, Rockwall, and Forney North TX Quadrangles, U.S.
Department of the Interior, Fish and Wildlife Service, Maps
dated 1989.**

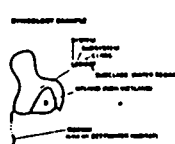
NATIONAL WETLANDS INVENTORY
UNITED STATES DEPARTMENT OF THE INTERIOR

8-1

Site location
PPE
Surface water pathway
↓



WETLANDS
The National Wetlands Inventory is a comprehensive map of the wetlands of the United States. It is the result of a nationwide effort to identify and map the wetlands of the United States. The inventory is a valuable tool for the management and protection of wetlands. It provides information on the location, extent, and characteristics of wetlands. This information is used by a variety of agencies and organizations to make decisions about the use and management of wetlands. The inventory is updated regularly to reflect changes in the wetlands of the United States.



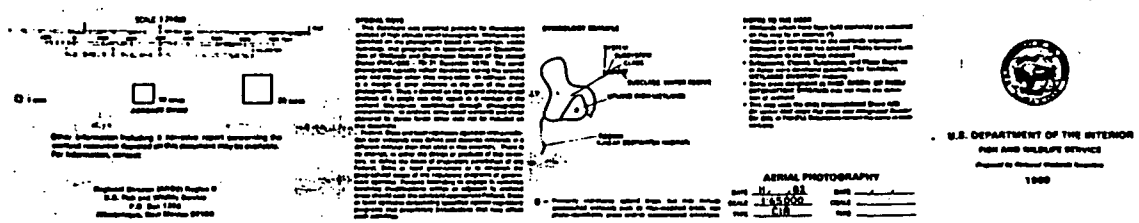
WETLANDS
The National Wetlands Inventory is a comprehensive map of the wetlands of the United States. It is the result of a nationwide effort to identify and map the wetlands of the United States. The inventory is a valuable tool for the management and protection of wetlands. It provides information on the location, extent, and characteristics of wetlands. This information is used by a variety of agencies and organizations to make decisions about the use and management of wetlands. The inventory is updated regularly to reflect changes in the wetlands of the United States.



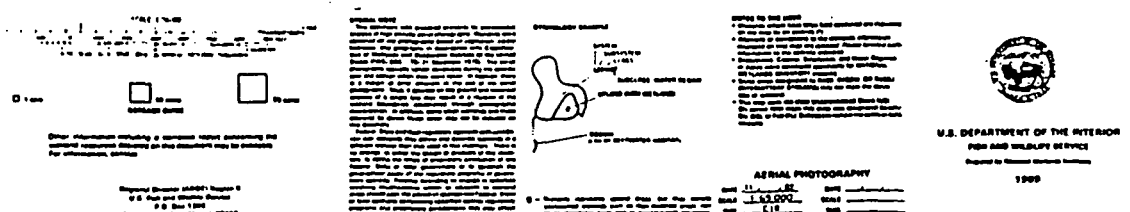
U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Wetlands Inventory
1988

WETLANDS		WETLANDS		WETLANDS		WETLANDS	
WETLAND TYPE	WETLAND SUBTYPE	WETLAND TYPE	WETLAND SUBTYPE	WETLAND TYPE	WETLAND SUBTYPE	WETLAND TYPE	WETLAND SUBTYPE
W1	W1.1	W2	W2.1	W3	W3.1	W4	W4.1
W5	W5.1	W6	W6.1	W7	W7.1	W8	W8.1
W9	W9.1	W10	W10.1	W11	W11.1	W12	W12.1
W13	W13.1	W14	W14.1	W15	W15.1	W16	W16.1
W17	W17.1	W18	W18.1	W19	W19.1	W20	W20.1
W21	W21.1	W22	W22.1	W23	W23.1	W24	W24.1
W25	W25.1	W26	W26.1	W27	W27.1	W28	W28.1
W29	W29.1	W30	W30.1	W31	W31.1	W32	W32.1
W33	W33.1	W34	W34.1	W35	W35.1	W36	W36.1
W37	W37.1	W38	W38.1	W39	W39.1	W40	W40.1
W41	W41.1	W42	W42.1	W43	W43.1	W44	W44.1
W45	W45.1	W46	W46.1	W47	W47.1	W48	W48.1
W49	W49.1	W50	W50.1	W51	W51.1	W52	W52.1
W53	W53.1	W54	W54.1	W55	W55.1	W56	W56.1
W57	W57.1	W58	W58.1	W59	W59.1	W60	W60.1
W61	W61.1	W62	W62.1	W63	W63.1	W64	W64.1
W65	W65.1	W66	W66.1	W67	W67.1	W68	W68.1
W69	W69.1	W70	W70.1	W71	W71.1	W72	W72.1
W73	W73.1	W74	W74.1	W75	W75.1	W76	W76.1
W77	W77.1	W78	W78.1	W79	W79.1	W80	W80.1
W81	W81.1	W82	W82.1	W83	W83.1	W84	W84.1
W85	W85.1	W86	W86.1	W87	W87.1	W88	W88.1
W89	W89.1	W90	W90.1	W91	W91.1	W92	W92.1
W93	W93.1	W94	W94.1	W95	W95.1	W96	W96.1
W97	W97.1	W98	W98.1	W99	W99.1	W100	W100.1

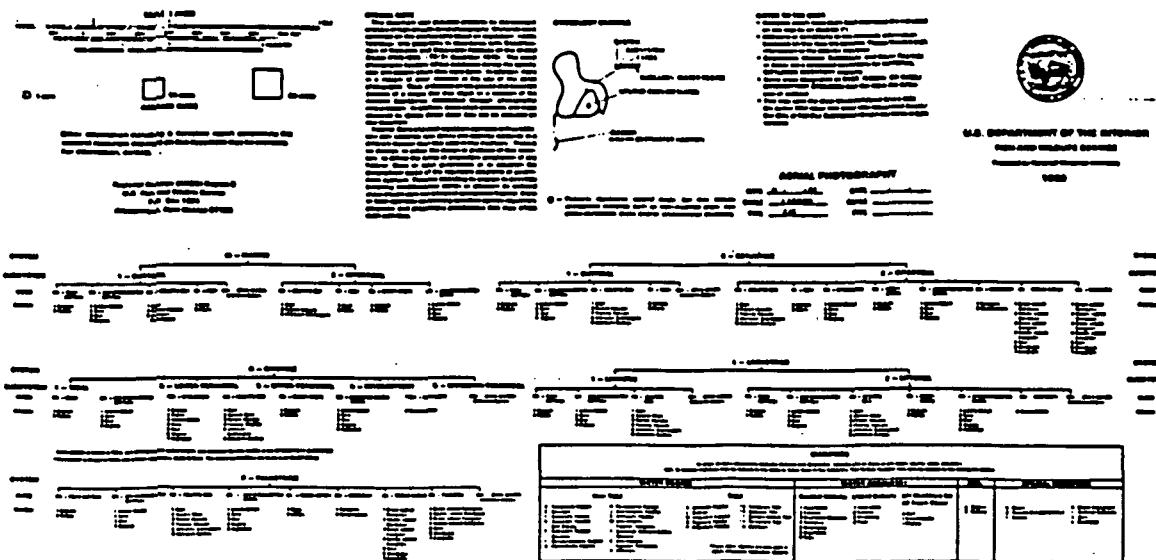
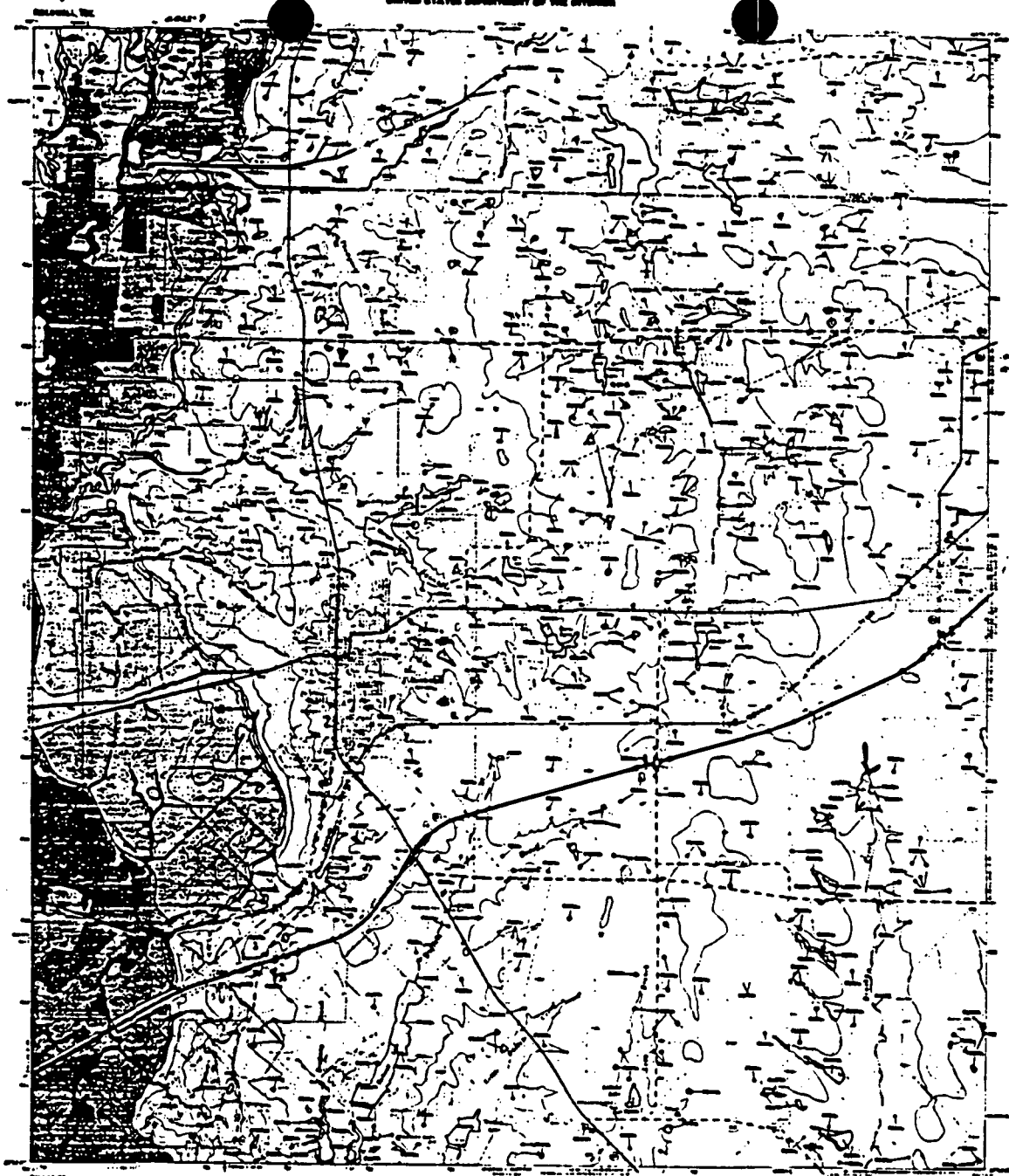
8.1

[illegible]

8-3



The image displays four pages of a document, likely a military or organizational chart. The pages are numbered 1, 2, 3, and 4. Each page contains a hierarchical diagram with boxes representing units or personnel, connected by lines. The diagrams are organized into columns and rows, with some boxes containing text. The overall structure suggests a complex organizational hierarchy.



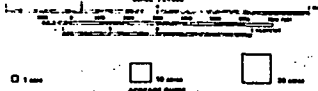
8-5

FORNEY NORTH, TEX



FORNEY NORTH, TEX.

SCALE 1:24,000

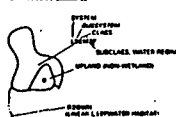


Other information including a narrative report concerning the method resources deployed on this document may be available. For information, contact:

Regional Director (MRO) Region II
U.S. Fish and Wildlife Service
P.O. Box 1304
Albuquerque, New Mexico 87103

[illegible]

SYNTHESIS EXAMPLE



1 - Primarily composed of land area, but some waterways within such as the Colorado River and the Gulf of Mexico are also included.

- Wiretaps which have been field installed are indicated on the map by an asterisk (*)
- Information received from wiretap information displayed on this map is obtained. Please forward such information to the address indicated.
- Baltimore, Chicago, Indianapolis, and New York Offices are advised separately specifically for FBIHQ, nationwide overnight shipping
- Some areas designated as RAB, BADO, or DIAL/DIVERTMENT STATIONS may not mean the deletion of material
- This map will show Unsubstantiated News Alerts (UNAL) and will mean that there will be no Substantiated (or SN), or Free (F) Substantiated against the person at each location.

AERIAL PHOTOGRAPHY

DATE: 11-1-82 DATE:
SCALE: 1:65,000 SCALE:
TYPE: CR TYPE:



U.S. DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE
Prepared by National Wetlands Inventory
1988

[illegible]

Reference 9

**Record of Telephone Conversation between Josh Sacker,
Fluor Daniel, and Jeff Reed, U.S. Fish & Wildlife Service
Ecological Division, April 7, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Josh Sacker *new for*

DATE: April 7, 1993

LOCATION: Irvine, 552M

TIME: _____

TO: Project File

P.O. NO. _____

LOCATION: _____

OTHER REF. ARCS 06/635336
Haz Ranking System

Conversation with Jeff Reed, U.S. Fish & Wildlife Service Ecological Division, Arlington, TX (817) 887-7830 Contact Re No. 2-12-93-P-128 (to be used in any future request or contact). Mr. Reed stated that there were no anticipated federally listed threatened or endangered species within the landfills (terrestrial), or within drainage pathways (aquatic species) leading from these landfills. I provided the location of the landfills as within 2 or 3 miles from the intersection of Route 66 and Centerville Road. He said he was very familiar with this area. Mr. Reed considered the possibility of bird species using habitats within the landfills or drainage pathways that are covered under the Migratory Bird Treaty Act. However, he concluded that, due to the urban/developed nature of the general vicinity, endangered or threatened species (including the whooping crane, bald eagle, cormorants, water turkeys) would not be expected in these areas. Various non-threatened species of ducks or geese are found in these areas. Mr. Reed stated that no federally listed species are expected to be at risk in these areas. He stated some of Rowlett Creek has been acquired by the City of Garland or County with state matching funds and is a wildlife/recreational sanctuary. He referred to the County (Dallas?) Open Space Plan regarding this issue. He also stated that there were no Federally Designated Sensitive Habitats in the area. He qualified this by saying Federally Designated Habitats includes many things, but that there were no federal habitats of concern in the area, other than the possible exception of wetlands. He said to contact Texas State Parks & Wildlife regarding State Listed Species at (512) 448-4311 (Austin, TX).

Action Items: Call Mr. Reed back

Questions:

1. Does lack of endangered or threatened species apply to Lake Ray Hubbard?
2. Does lack of endangered or threatened species apply to plant species?
3. Can you respond to this telephone conversation in writing.

Reference 10

**Record of Telephone Conversation between Josh Sacker,
Fluor Daniel, and Dorinda Sullivan, State of Texas Parks &
Wildlife, April 7, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Josh Sacker *W for*

DATE: 4/7/93

LOCATION: Environmental Services

TIME: _____

TO: Project Files - ARCS

P.O. NO. _____

LOCATION: _____

OTHER REF. ARCS Haz. Ranking System

Conversation with Ms. Dorinda Sullivan who is with the State of Texas Parks & Wildlife at (512) 448-4311.

Ms. Sullivan stated that there were no known endangered or threatened species in the landfill areas or drainage pathways from these landfills all the way to and including Lake Ray Hubbard. Of possible environmental sensitivity are rookeries (bird nesting grounds) for Cattle Egrets and Little Blue Herons, neither of which is threatened or endangered; however, she said he did not believe the lake was a locality for Bald Eagles or Whooping Cranes. However, the State's effort regarding the Bald Eagle has been deficient recently. The Texas Garder Snake is listed by the State in Category 2, which indicates that available information suggests there may be reason to warrant listing as threatened or endangered, but that additional information needs to be collected before final determination can be made.

There are no sensitive habitats (such as parks or wildlife sanctuaries) in the area according to Ms. Sullivan, with the possible exception of wetlands. There may be some significant woodland areas near Lake Ray Hubbard (Sugarberry-Elm or Texas Oak Series), but the State has not identified these as sensitive areas. Plant species in and around landfill are not endangered and include common grasses such as Little Blue Stern and Indian Grass Stern. If previously undisturbed areas are to be disturbed during landfill closure then "Native Prairie Remanents" requirements may take effect. For additional information particularly in regard to migratory birds, call Mark Mitchell in Lolita, Texas at (512) 874-4401 (he may work out of his home).

Reference 11

**Record of Telephone Conversation between Tom Casabonne,
Fluor Daniel, and Ken Smith, Landfill Director City of Garland
Sanitation Department, April 5, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne TJC

DATE: 4-5-93

LOCATION: Irvine, X6657

TIME: 9:00 am

TO: Ken Smith (214) 205-2713

P.O. NO. _____

LOCATION: Garland, TX,

OTHER REF. Site access

Mr. Smith said that when a difference occurs between his records and the Dallas County Tax Office records regarding site ownership, he would defer to the county's records. The county had shown different ownership on sites such as Quail Creek, where Mr. Smith's records indicated owners such as Sunbelt Federal Savings. The county shows other owners (refer to my two previous telephone logs with Ken Smith and the County Tax Office). Mr. Smith also said to send letters to him when we request site access. He will also escort Fluor Daniel around the sites when a site visit is made.

He said that the 13 wells around the current site (Castle Drive) are 35 to 50 feet deep. The site has a clay liner which is a minimum of 3 ft. thick, and the state requires soil caps on closed landfills. He also has analytical data from the well monitoring program, although it was too much information for him to fax. All of the other sites in the area just have a natural clay liner, with approximately 2 ft. of topsoil for a cap. At the East Miller Road Site, Mr. Smith said that the Lakeview subdivision is not on the old site—it is approximately 100 ft. south of the site. The City of Dallas owns the land east of the East Miller Road site because it falls within the "take line" for Lake Ray Hubbard.

Reference 12

**Castle Miles Landfill, Sampling Investigation, Soil and Ground
Water Sample Data Validation Package, Fluor Daniel,
October, 1993.**

DATA QUALITY ASSURANCE REVIEW

Site Name: Castle Miles Landfill
Site Code: TXD980750368
Case Number: 20267

Laboratory: American Analytical - Broken Arrow, OK

Soil Samples: MFAP79, MFAP80, MFAP81, MFAP82,
MFAP83, MFAP84, MFAP85, MFAP86,
MFAP87, MFAP88, MFAP89, MFAP81D

The data package consists of 12 soil samples analyzed for TCL metals and cyanide. One sample was a duplicate.

1. Analytical Parameters: All samples were analyzed using low concentration samples.
2. Holding Times: All sample preparation and analysis were conducted within holding time limits.
3. Calibration Verification: There is no indication that the cyanide standard was distilled. All cyanide data is flagged as (J). All initial calibration verification results were within control limits. All continuing calibration verifications were conducted at the proper frequency and the results were within control limits.
4. Blanks: All blanks were at the IDL except copper and silver

The blank concentrations for copper were generally above the IDL. The highest value was 4.8 mg/l. All sample analyte concentrations were less than five times this concentration and, therefore, were flagged (B).

The blank concentration for silver was above the IDL, but did not affect the results since all sample concentrations were below the IDL.
5. Matrix Spike Recovery: The spike recovery (%R) was miscalculated for cyanide, mercury, and manganese. Corrections should be as follows:

ELEMENT/IONIC SPECIES	%R LISTED VALUE	TRUE VALUE
Hg	110.0	90.0
Mn	-363.5	-363.4
Cn	101.4	91.4

Spike recovery for barium and vanadium exceeded quality control limits. Analyte concentrations of these two elements are flagged (J).

All other matrix spikes were within quality control limits.

6. Duplicates: The relative percent difference for aluminum, iron, and manganese exceed the quality control limit of 35%. As such, analyte concentrations of these elements are flagged (J).

The relative percent difference for all other elements meet the quality control criteria.

7. Laboratory Control Samples: Quality control criteria were met in all samples.
8. ICP Interference Check Sample (ICS): ICP interference check samples were analyzed at the specified frequency and the results were within control limits.
9. ICP Serial Dilution: Quality control criteria were met in all samples.
10. Furnace AA: Furnace Atomic Absorption Raw Data was not part of this validation package.
11. Sample Result Verification: Data package had no missing or incorrectly numbered pages.
12. Overall Assessment of Data: The data package is acceptable except for the following:
 - a. Blank interference with copper analyte.
 - b. Failure to dilute the mid-range cyanide standard.
 - c. Duplicate relative difference for aluminum, iron and manganese being beyond control limits.
 - d. Matrix Spike Recovery for barium and vanadium being beyond control limits.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles Landfill, TXD980750368

Case Number: 20267

Concentrations in milligrams/kilogram (mg/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP79	MFAP80	MFAP81	MFAP82	MFAP83	MFAP84	MFAP85
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Solids	80.8	77.7	79.4	81.4	84.9	78.1	81.7
Location:	SS-01	SS-02	SS-03	SS-04	SS-05	SS-06	SS-07
and or							
Sample							
Description:							

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	27,600.00	J	32,900.00	J	32,600.00	J	15,900.00	J	9,100.00	J	10,200.00	J
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	3.60		5.00		6.80		4.00		4.40		4.70	
BARIUM	7440-39-3	INO	229.00	J	169.00	J	349.00	J	190.00	J	196.00	J	190.00	J
BERYLLIUM	7440-41-7	INO	1.10		1.10		1.20		1.00	U	1.00	U	1.00	U
CADMIUM	7440-43-9	INO												
CALCIUM	7440-70-2	INO	7,750.00		144,000.00		73,800.00		78,700.00		97,100.00		85,500.00	
CHROMIUM	7440-47-3	INO	22.10		33.10		28.90		15.10		8.20		9.70	
COBALT	7440-48-4	INO	8.20		6.40		15.80		6.00		10.70		7.30	
COPPER	7440-50-8	INO	17.50	B	17.00	B	19.80	B	12.10	B	7.90	B	12.10	B
IRON	7439-89-6	INO	16,600.00	J	20,100.00	J	21,800.00	J	12,600.00	J	8,260.00	J	10,100.00	J
LEAD	7439-92-1	INO	19.70		21.50		26.70		18.80		14.70		17.90	
MAGNESIUM	7439-95-4	INO	2,950.00		4,880.00		3,880.00		2,520.00		1,650.00		2,270.00	
MANGANESE	7439-96-5	INO	515.00	J	605.00	J	1,030.00	J	522.00	J	681.00	J	643.00	J
MERCURY	7439-97-6	INO												
NICKEL	7440-02-0	INO	21.00	U	21.20		30.30		21.00	U	21.00	U	21.00	U
POTASSIUM	7440-09-7	INO	1,150.00		3,690.00		2,360.00		1,320.00		1,010.00		1,150.00	
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO												
SODIUM	7440-23-5	INO	183.00	U	445.00		402.00		359.00		219.00		264.00	
THALLIUM	7440-28-0	INO												
VANADIUM	7440-62-2	INO	34.30	J	55.40	J	61.40	J	32.40	J	25.50	J	29.60	J
ZINC	7440-66-6	INO	38.20		75.50		54.40		37.60		30.10		38.00	
CYANIDE		INO	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U

LEGEND

INO - Inorganic

B - Blank Interference. Analyte conc. < 5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles Landfill, TXD980750368

Case Number: 20267

Concentrations in milligrams/kilogram (mg/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP86	MFAP87	MFAP88	MFAP89	MFAP81D		
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL		
Percent Solids	80.5	73.5	80.2	82.1	79.4		
Location:	SS-08	SS-09	SS-10	SS-11	SS-03		
and or							
Sample			BACKGROUND	BACKGROUND	DUPLICATE		
Description:							

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	33,900.00	J	38,600.00	J	28,500.00	J	36,800.00	J	14,794.81	J		J
ANTIMONY	7440-36-0	INO					19.00	U	19.00	U				
ARSENIC	7440-38-2	INO	4.30		4.80		3.00	U	3.40		4.30			
BARIUM	7440-39-3	INO	200.00	J	321.00	J	203.00	J	302.00	J	221.82	J		
BERYLLIUM	7440-41-7	INO	1.00	U	1.30		1.00	U	1.20		1.00	U		
CADMIUM	7440-43-9	INO					2.00	U	2.00	U				
CALCIUM	7440-70-2	INO	90,600.00		30,400		5,740.00		6,140.00		56,755.62			
CHROMIUM	7440-47-3	INO	28.20		32.60		21.90		29.00		13.37			
COBALT	7440-48-4	INO	7.80		17.90		5.00	U	14.20		6.81			
COPPER	7440-50-8	INO	10.90	B	13.30	B	9.90	B	11.30	B	14.42	B		
IRON	7439-89-6	INO	18,100.00	J	21,700.00	J	15,700.00	J	19,400.00	J	11,539.74	J		
LEAD	7439-92-1	INO	16.00		23.60		14.30		21.80		20.07			
MAGNESIUM	7439-95-4	INO	4,440.00		4,890.00		2,470.00		2,950.00		2,228.06			
MANGANESE	7439-96-5	INO	736.00	J	1,670.00	J	187.00	J	710.00	J	550.19	J		
MERCURY	7439-97-6	INO					0.20	U	0.20	U				
NICKEL	7440-02-0	INO	21.00	U	26.40		21.00	U	21.00	U	21.00	U		
POTASSIUM	7440-09-7	INO	2,640.00		2,970.00		1,140.00		1,770.00		1,202.54			
SELENIUM	7782-49-2	INO					4.00	U	4.00	U				
SILVER	7440-22-4	INO					3.00	U	3.00	U				
SODIUM	7440-23-5	INO	255.00		183.00		284.00		273.00		361.59			
THALLIUM	7440-28-0	INO					7.00	U	7.00	U				
VANADIUM	7440-62-2	INO	57.00	J	66.80	J	30.50	J	50.30	J	32.49	J		
ZINC	7440-66-6	INO	46.8		54.00		36.00		43.00		34.71			
CYANIDE		INO	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U		

LEGEND

INO - Inorganic

B - Blank Interference. Analyte conc. < 5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

DATA QUALITY ASSURANCE REVIEW

Site Name: Castle Miles Landfill
Site Code: TXD980750368
Case Number: 20267

Laboratory: American Analytical - Broken Arrow, OK

Water Samples: MFAP75, MFAP76, MFAP90, MFAP91,
MFAP92, MFAP93, MFAP94, MFAP95,
MFAP75D

The data package consists of nine water samples analyzed for TCL metals and cyanide. One sample was a duplicate.

1. Analytical Parameters: All samples were analyzed using multi-media low concentration protocols.
2. Holding Times: All sample preparation and analysis were conducted within holding time limits.
3. Calibration Verification:

All initial calibration verification results were within control limits. All continuing calibration verifications were conducted at the proper frequency and the results were within control limits.

4. Blanks:

The laboratory blanks for iron are above the IDL. Analyte concentrations less than five times these blanks are flagged (B).

Field blank concentrations for aluminum, sodium and thallium are greater than IDL. All analyte concentrations of these elements less than five times the field blank are flagged (B).

5. Matrix Spike Recovery: All matrix spike recoveries were within control limits. The following spike recovery limits were miscalculated:

ELEMENT	%R LISTED VALUE	TRUE VALUE
Antimony	103.1	99.3
Arsenic	108.0	107.8
Copper	114.0	112.8
Zinc	105.4	104.0

6. Duplicates: All relative percent difference values were within control limits.
7. Laboratory Control Samples: Quality control criteria were met in all samples.
8. ICP Interference Check Sample (ICS): ICP interference check samples were analyzed at the specified frequency and the results were within control limits.
9. ICP Serial Dilution: Thallium %D was incorrectly calculated. The listed value was 100.0. The correct value is 230.2.

The %D for sodium is 19.1%, as such, all sodium analyte concentrations are flagged (J).

All other serial dilutions meet quality control criteria.

10. Furnace AA: Furnace Atomic Absorption Raw Data was not part of the data package.
11. Sample Result Verification: Data package had no missing or incorrectly numbered pages.
12. Overall Assessment of Data: The data package is acceptable except for blank interference with the iron analyte concentrations. These were flagged (B).

Field blank aluminum, sodium, and thallium concentrations were greater than the IDL. All analyte concentrations less than field blank are undetected. All analyte concentrations less than five times field blank are flagged (B).

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles Landfill, TXD980750368

Case Number: 20267

Concentration in micrograms/liter (ug/l)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP75	MFAP76	MFAP75D	MFAP95	MFAP90	MFAP91	MFAP92
Matrix:	WATER	WATER	WATER	WATER	WATER	WATER	WATER
Percent Solids	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Location:	GW-16	GW-16	GW-16	GW-20	GW-12	GW-13	GW-14
and or			DUPLICATE				
Sample							
Description:		Background					

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	115.00	B	195.00	B	130.65	B	31.00	U	276.00	B	31.00	U
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	3.00	U	3.00	U	3.00	U	18.40		3.00	U	21.80	22.00
BARIUM	7440-39-3	INO	445.00		39.40		403.28		144.00		284.00		831.00	826.00
BERYLLIUM	7440-41-7	INO												
CADMIUM	7440-43-9	INO												
CALCIUM	7440-70-2	INO	134,000.00		120,000.00		122,345.87		149,000.00		94,700.00		173,000.00	170,000.00
CHROMIUM	7440-47-3	INO												
COBALT	7440-48-4	INO	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	8.50	7.70
COPPER	7440-50-8	INO												
IRON	7439-89-6	INO	381.00		102.00		377.56		28.60	B	650.00		21,800.00	21,300.00
LEAD	7439-92-1	INO												
MAGNESIUM	7439-95-4	INO	5460.00		14,000.00		4,967.73		8,180.00		8,720.00		23,700.00	23,500.00
MANGANESE	7439-96-5	INO	312.00		6.10		283.73		47.50		88.50		1,620.00	1,640.00
MERCURY	7439-97-6	INO												
NICKEL	7440-02-0	INO												
POTASSIUM	7440-09-7	INO	796.00	U	796.00	U	796.00	U	796.00	U	796.00	U	800.00	916.00
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO												
SODIUM	7440-23-5	INO	10,500.00	J	48,500.00	J	10,560.66	J	18,000.00	J	60,500.00	J	92,500.00	91,700.00
THALLIUM	7440-28-0	INO	10.60	B	7.00	U	7.00	U	13.40	B	13.80	B	42.90	41.90
VANADIUM	7440-62-2	INO												
ZINC	7440-66-6	INO	7.00	U	7.00	U	7.00	U	7.00	U	7.00	U	7.00	7.00
CYANIDE		INO	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	10.00

LEGEND

INO - Inorganic

B - Blank Interference. Analyte conc. < 5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles Landfill, TXD980750368

Case Number: 20267

Concentration in micrograms/liter (ug/l)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP93	MFAP94					
Matrix:	WATER	WATER					
Percent Solids	0.0	0.0					
Location:	L-15	GW-17					
and or							
Sample Description:	Trip Blank						

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	103.00	B	172.00	B								
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	3.00	U	3.00	U								
BARIUM	7440-39-3	INO	6.00	U	410.00									
BERYLLIUM	7440-41-7	INO												
CADMIUM	7440-43-9	INO												
CALCIUM	7440-70-2	INO	200.00	U	191,000.00									
CHROMIUM	7440-47-3	INO												
COBALT	7440-48-4	INO	5.00	U	5.00	U								
COPPER	7440-50-8	INO												
IRON	7439-89-6	INO	8.00	U	3,670.00									
LEAD	7439-92-1	INO												
MAGNESIUM	7439-95-4	INO	114.00	U	8,160.00									
MANGANESE	7439-96-5	INO	2.00	U	169.00									
MERCURY	7439-97-6	INO												
NICKEL	7440-02-0	INO												
POTASSIUM	7440-09-7	INO	796.00	U	796.00	U								
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO												
SODIUM	7440-23-5	INO	398.00	BJ	97,700.00	J								
THALLIUM	7440-28-0	INO	10.50	B	23.20	B								
VANADIUM	7440-62-2	INO												
ZINC	7440-66-6	INO	7.00	U	12.20									
CYANIDE		INO	10.00	U	10.00	U								

LEGEND

INO - Inorganic

B - Blank Interference. Analyte conc. < 5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

ORGANIC DATA VALIDATION

Case No.: 20267 Site: Castle Miles Landfill
Laboratory: ARI No. of Samples: 19
SDG#: FAA59 Matrix: Soil and Water

Soil Samples: FA-A63, FA-A64, FA-A65, FA-A66, FA-A67, FA-A68,
FA-A69, FA-A70, FA-A71, FA-A72, FA-A73

Water Samples: FA-A59, FA-A60, FA-A74, FA-A75, FA-A76, FA-A77,
FA-A78, FA-A79

Comments: Eleven soil samples and eight water samples from the Castle Miles Landfill were analyzed. Anticipated concentrations were low. Samples were not analyzed within the allowable holding times. VOA, BNA, and pesticides data are provisional. Problems were encountered in the calibration of VOAs and BNAs and the pesticide analysis sequence was not acceptable because a standard was not analyzed after every fifth sample. All detectable concentrations are qualified as estimates.

1. Holding Times

VOA: The solid samples met EPA QA/QC criteria but the water samples exceeded the allowed holding times. Reported VOA values in water samples were qualified as estimates.

BNA: The water samples met the EPA QA/QC criteria but the extraction holding times were exceeded for all soil samples.

Pest/PCB: The water samples met the EPA QA/QC criteria but the extraction holding times were exceeded for all soil samples. Reported Pest/PCB values in soil samples were qualified as estimates.

2. Tuning/Performance

VOA: Meets EPA QA/QC criteria.

BNA: Meets EPA QA/QC criteria.

Pest/PCB: The Analysis Sequence did not meet EPA QA/QC criteria.

3. Calibrations

VOA: %D for chloromethane, bromoform, and acetone all exceeded EPA QA/QC criterion of 25%.

BNA: %D for 2,4-Dinitrophenol exceeded EPA QA/QC criterion of 25%. Internal standards for samples FA-A63, FA-A64, FA-A69, FA-A70, FA-A71 and FA-A72 did not meet area requirements. Samples were rerun and internal standards were outside area specifications again.

Pest/PCB: %RSD for Linearity Check Compounds failed EPA QA/QC criterion of 10%. %D for standards failed EPA QA/QC criterion of 15% for quantitative columns. %D for standards failed EPA QA/QC criterion of 20% for confirmatory columns.

4. Blanks

VOA: Meets EPA QA/QC criteria.

BNA: Meets EPA QA/QC criteria.

Pest/PCB: Meets EPA QA/QC criteria.

5. System Monitoring Compounds (SMCs)/Surrogates

VOA: Meets EPA QA/QC criteria.

BNA: Meets EPA QA/QC criteria.

Pest/PCB: Surrogate recoveries were not acceptable for samples FA-A59, FA-A76MS, and FA-A76MSD.

6. Matrix Spike/Matrix Spike Duplicates

VOA: Meets EPA QA/QC criteria.

BNA: MS and MSDs were out of compliance because reported values exceeded allowable ranges for recovery. Recovery of 4-Nitrophenol, Pentachlorophenol, 1,4-Dichlorobenzene, and 1,2,4-Trichlorobenzene did not meet standards.

Pest/PCB: Meets EPA QA/QC criteria.

7a. Compound Identity/Quantitation

VOA: Meets EPA QA/QC criteria.

BNA: Meets EPA QA/QC criteria.

Pest/PCB: Meets EPA QA/QC criteria.

7b. Data Completeness

VOA: Meets EPA QA/QC criteria.

BNA: Meets EPA QA/QC criteria.

Pest/PCB: Data package provided did not correspond to the requirements of the EPA data validation procedures.

8. Case Assessment

VOA: Water samples were not analyzed within the allowed holding times. Calibrations of several VOA parameters were out of compliance. Data are provisional.

BNA: Calibrations of a few SVOA parameters were out of compliance. Soil sample extracts were not analyzed within the allowed holding time. Data are provisional.

Pest/PCB: Calibrations of a few Pesticide/PCB parameters were out of compliance. The analytical sequence was not correct. Soil sample extracts were not analyzed within the allowed holding time. Data are provisional.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/L

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location and/or
Sample
Description:

FA-A59	FA-A60	FA-A63	FA-A64	FA-A65	FA-A66	FA-A67
WATER	WATER	SOIL	SOIL	SOIL	SOIL	SOIL
GW-16	GW-18	18 SS-01	21 SS-02	21 SS-03	14 SS-04	16 SS-05
	Background					

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Chloromethane	74-87-3	VOA			10 U									
Bromomethane	74-83-9	VOA			10 U									
Vinyl Chloride	75-01-4	VOA	10 U		10 U		12 U		12 U		12 U		11 U	
Chloroethane	75-00-3	VOA			10 U									
Methylene Chloride	75-09-2	VOA			10 U									
Acetone	67-64-1	VOA			10 U									
Carbon Disulfide	75-15-0	VOA			10 U									
1,1-Dichloroethene	75-35-4	VOA			10 U									
1,1-Dichloroethane	75-34-3	VOA	10 U		10 U		12 U		12 U		12 U		11 U	
1,2-Dichloroethene (total)	540-59-0	VOA	10 U		10 U		12 U		12 U		12 U		11 U	
Chloroform	67-66-3	VOA			10 U									
1,2-Dichloroethane	107-06-2	VOA			10 U									
2-Butanone	78-93-3	VOA			10 U									
1,1,1-Trichloroethane	71-55-6	VOA			10 U									
Carbon tetrachloride	56-23-5	VOA			10 U									
Bromodichloromethane	75-27-4	VOA			10 U									
1,2-Dichloropropane	78-87-5	VOA			10 U									
cis-1,3-Dichloropropene	10061-01-5	VOA			10 U									
Trichloroethene	79-01-6	VOA	10 U		10 U		12 U		12 U		12 U		11 U	
Dibromochloromethane	124-48-1	VOA			10 U									
1,1,2-Trichloroethane	79-00-5	VOA			10 U									
Benzene	71-43-2	VOA			10 U									
Trans-1,3-Dichloropropene	10061-02-6	VOA			10 U									
Bromoform	75-25-2	VOA			10 U									
4-Methyl-2-Pentanone	108-10-1	VOA			10 U									
2-Hexanone	591-78-6	VOA			10 U									
Tetrachloroethene	127-18-4	VOA			10 U									
1,1,2,2-Tetrachloroethane	79-34-5	VOA			10 U									
Toluene	108-88-3	VOA			10 U									
Chlorobenzene	108-90-7	VOA			10 U									
Ethylbenzene	100-41-4	VOA			10 U									
Styrene	100-42-5	VOA			10 U									
Xylene (total)	1330-20-7	VOA			10 U									

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

B - Analyte was detected in the blank.

J - The associated numerical value is an estimated quantity.

R - Data for analyte is unusable (compound may or may not be present).

N - Presumptive evidence of presence of the material.

NJ - Presumptive evidence of the presence of the material at an estimated quantity.

UU - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations In micrograms/kilogram (ug/kg) or ug/l

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A68	FA-A69	FA-A70	FA-A71	FA-A72	FA-A73	FA-A74
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
20	19	22	26	20	19	
SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	GW-12
				Background Sample	Background Sample	

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Chloromethane	74-87-3	VOA									12 U	U	12 U	U
Bromomethane	74-83-9	VOA									12 U	U	12 U	U
Vinyl Chloride	75-01-4	VOA	12 U	U	12 U	U	13 U	U	14 U	U	12 U	U	12 U	U
Chloroethane	75-00-3	VOA									12 U	U	12 U	U
Methylene Chloride	75-09-2	VOA									12 U	U	12 U	U
Acetone	67-64-1	VOA									12 U	U	12 U	U
Carbon Disulfide	75-15-0	VOA									12 U	U	12 U	U
1,1-Dichloroethene	75-35-4	VOA									12 U	U	12 U	U
1,1-Dichloroethane	75-34-3	VOA	12 U	U	12 U	U	13 U	U	14 U	U	12 U	U	12 U	U
1,2-Dichloroethene (total)	540-59-0	VOA	12 U	U	12 U	U	13 U	U	14 U	U	12 U	U	12 U	U
Chloroform	67-66-3	VOA									12 U	U	12 U	U
1,2-Dichloroethane	107-06-2	VOA									12 U	U	12 U	U
2-Butanone	78-93-3	VOA									12 U	U	12 U	U
1,1,1-Trichloroethane	71-55-6	VOA									12 U	U	12 U	U
Carbon tetrachloride	56-23-5	VOA									12 U	U	12 U	U
Bromodichloromethane	75-27-4	VOA									12 U	U	12 U	U
1,2-Dichloropropane	78-87-5	VOA									12 U	U	12 U	U
cis-1,3-Dichloropropene	10061-01-5	VOA									12 U	U	12 U	U
Trichloroethene	79-01-6	VOA	12 U	U	12 U	U	13 U	U	14 U	U	12 U	U	12 U	U
Dibromochloromethane	124-48-1	VOA									12 U	U	12 U	U
1,1,2-Trichloroethane	79-00-5	VOA									12 U	U	12 U	U
Benzene	71-43-2	VOA									12 U	U	12 U	U
Trans-1,3-Dichloropropene	10061-02-6	VOA									12 U	U	12 U	U
Bromoform	75-25-2	VOA									12 U	U	12 U	U
4-Methyl-2-Pentanone	108-10-1	VOA									12 U	U	12 U	U
2-Hexanone	591-78-6	VOA									12 U	U	12 U	U
Tetrachloroethene	127-18-4	VOA									12 U	U	12 U	U
1,1,2,2-Tetrachloroethane	79-34-5	VOA									12 U	U	12 U	U
Toluene	108-88-3	VOA									12 U	U	12 U	U
Chlorobenzene	108-90-7	VOA									12 U	U	12 U	U
Ethylbenzene	100-41-4	VOA									12 U	U	12 U	U
Styrene	100-42-5	VOA									12 U	U	12 U	U
Xylene (total)	1330-20-7	VOA									12 U	U	12 U	U

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

B - Analyte was detected in the blank.

J - The associated numerical value is an estimated quantity.

R - Date for analyte is unusable (compound may or may not be present).

N - Presumptive evidence of presence of the material.

NJ - Presumptive evidence of the presence of the material at an estimated quantity.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:

Matrix:

Percent Moisture:

Location

and/or

Sample

Description:

FA-A75	FA-A76	FA-A77	FA-A78	FA-A79		
WATER	WATER	WATER	WATER	WATER		
GW-13	GW-14	L-15	GW-17	GW-20		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Chloromethane	74-87-3	VOA														
Bromomethane	74-83-9	VOA														
Vinyl Chloride	75-01-4	VOA	28 J		25 J		10 U		10 U		10 U					
Chloroethane	75-00-3	VOA														
Methylene Chloride	75-09-2	VOA														
Acetone	67-64-1	VOA														
Carbon Disulfide	75-15-0	VOA														
1,1-Dichloroethene	75-35-4	VOA														
1,1-Dichloroethane	75-34-3	VOA	34 J		36 J		10 U		10 U		10 U					
1,2-Dichloroethene (total)	540-59-0	VOA	100 J		110 J		10 U		10 U		10 U					
Chloroform	67-66-3	VOA														
1,2-Dichloroethane	107-06-2	VOA														
2-Butanone	78-93-3	VOA														
1,1,1-Trichloroethane	71-55-6	VOA														
Carbon tetrachloride	56-23-5	VOA														
Bromodichloromethane	75-27-4	VOA														
1,2-Dichloropropane	78-87-5	VOA														
cis-1,3-Dichloropropene	10061-01-5	VOA														
Trichloroethene	79-01-6	VOA	11 J		12 J		10 U		10 U		10 U					
Dibromochloromethane	124-48-1	VOA														
1,1,2-Trichloroethane	79-00-5	VOA														
Benzene	71-43-2	VOA														
Trans-1,3-Dichloropropene	10061-02-6	VOA														
Bromoform	75-25-2	VOA														
4-Methyl-2-Pentanone	108-10-1	VOA														
2-Hexanone	591-78-6	VOA														
Tetrachloroethene	127-18-4	VOA														
1,1,2,2-Tetrachloroethane	79-34-5	VOA														
Toluene	108-88-3	VOA														
Chlorobenzene	108-90-7	VOA														
Ethylbenzene	100-41-4	VOA														
Styrene	100-42-5	VOA														
Xylene (total)	1330-20-7	VOA														

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

B - Analyte was detected in the blank.

J - The associated numerical value is an estimated quantity.

R - Data for analyte is unusable (compound may or may not be present).

N - Presumptive evidence of presence of the material.

NJ - Presumptive evidence of the presence of the material at an estimated quantity.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368
Case Number: 20267
Concentrations in micrograms/kilogram (ug/kg) or ug/l.
Compiled by: Fluor Daniel, Inc.

Traffic Number:	FA-A59	FA-A60	FA-A63	FA-A64	FA-A65	FA-A66	FA-A67
Matrix:	WATER	WATER	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Moisture:			18	21	21	14	16
Location and/or Sample Description:	GW-16	GW-18 Background	SS-01	SS-02	SS-03	SS-04	SS-05

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Phenol	108-95-2	BNA			10	U										
bis(2-Chloroethyl)Ether	111-44-4	BNA			10	U										
2-Chlorophenol	95-57-8	BNA			10	U										
1,3-Dichlorobenzene	541-73-1	BNA			10	U										
1,4-Dichlorobenzene	106-46-7	BNA			10	U										
1,2-Dichlorobenzene	95-50-1	BNA			10	U										
2-Methylphenol	95-48-7	BNA			10	U										
2,2'-Oxybis(1-Chloropropane)	108-60-1	BNA			10	U										
4-Methylphenol	106-44-5	BNA			10	U										
N-Nitroso-Di-n-Propylamine	621-64-7	BNA			10	U										
Hexachloroethane	67-72-1	BNA			10	U										
Nitrobenzene	98-95-3	BNA			10	U										
Isophorone	78-59-1	BNA			10	U										
2-Nitrophenol	88-75-5	BNA			10	U										
2,4-Dimethylphenol	105-67-9	BNA			10	U										
bis(2-Chloroethoxy)Methane	111-91-1	BNA			10	U										
2,4-Dichlorophenol	120-83-2	BNA			10	U										
1,2,4-Trichlorobenzene	120-82-1	BNA			10	U										
Naphthalene	91-20-3	BNA			10	U										
4-Chloroaniline	106-47-8	BNA			10	U										
Hexachlorobutadiene	87-68-3	BNA			10	U										
4-Chloro-3-Methylphenol	59-50-7	BNA			10	U										
2-Methylnaphthalene	91-57-6	BNA			10	U										
Hexachlorocyclopentadiene	77-47-4	BNA			10	U										
2,4,6-Trichlorophenol	88-06-2	BNA			10	U										
2,4,5-Trichlorophenol	95-95-4	BNA			25	U										
2-Chloronaphthalene	91-58-7	BNA			10	U										
2-Nitroaniline	88-74-4	BNA			25	U										
Dimethyl Phthalate	131-11-3	BNA			10	U										
Acenaphthylene	208-96-8	BNA			10	U										
2,6-Dinitrotoluene	606-20-2	BNA			10	U										
3-Nitroaniline	99-09-2	BNA			25	U										
Acenaphthelene	83-32-9	BNA			10	U										

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
B - Analyte was detected in the blank.
J - The associated numerical value is an estimated quantity.
R - Date for analyte is unusable (compound may or may not be present).
N - Presumptive evidence of presence of the material.
NJ - Presumptive evidence of the presence of the material at an estimated quantity.
UU - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368
Case Number: 20267
Concentrations in micrograms/kilogram (ug/kg) or ug/l.
Compiled by: Fluor Daniel, Inc.

Traffic Number:	FA-A59	FA-A60	FA-A63	FA-A64	FA-A65	FA-A66	FA-A67
Matrix:	WATER	WATER	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Moisture:			18	21	21	14	16
Location and/or Sample Description:	GW-16	GW-18 Background	SS-01	SS-02	SS-03	SS-04	SS-05

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
2,4-Dinitrophenol	51-28-5	BNA			25	U										
4-Nitrophenol	100-02-7	BNA			25	U										
Dibenzofuran	132-64-9	BNA			10	U										
2,4-Dinitrotoluene	121-14-2	BNA			10	U										
Diethylphthalate	84-66-2	BNA			10	U										
4-Chlorophenyl-phenylether	7005-72-3	BNA			10	U										
Fluorene	86-73-7	BNA			10	U										
4-Nitroaniline	100-01-6	BNA			25	U										
4,6-Dinitro-2-Methylphenol	534-52-1	BNA			25	U										
N-Nitrosodiphenylamine(1)	86-30-6	BNA			10	U										
4-Bromophenyl-phenylether	101-55-3	BNA			10	U										
Hexachlorobenzene	118-74-1	BNA			10	U										
Pentachlorophenol	87-86-5	BNA			25	U										
Phenanthrene	85-01-8	BNA			10	U										
Anthracene	120-12-7	BNA			10	U										
Carbazole	86-74-8	BNA			10	U										
Di-n-Butylphthalate	84-74-2	BNA			10	U										
Fluoranthene	206-44-0	BNA			10	U										
Pyrene	129-00-0	BNA			10	U										
Butylbenzylphthalate	85-68-7	BNA			10	U										
3,3'-Dichlorobenzidine	91-94-1	BNA			10	U										
Benzo(a)Anthracene	56-55-3	BNA			10	U										
Chrysene	218-01-9	BNA			10	U										
bis(2-Ethylhexyl)Phthalate	117-81-7	BNA			10	U										
Di-n-Octyl Phthalate	117-84-0	BNA			10	U										
Benzo(b)Fluoranthene	205-99-2	BNA			10	U										
Benzo(k)Fluoranthene	207-08-9	BNA			10	U										
Benzo(a)Pyrene	50-32-8	BNA			10	U										
Indeno(1,2,3-cd)Pyrene	193-39-5	BNA			10	U										
Bibenz(a,h)Anthracene	53-70-3	BNA			10	U										
Benzo(g,h,i)Perylene	191-24-2	BNA			10	U										

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.
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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:	FA-A68	FA-A69	FA-A70	FA-A71	FA-A72	FA-A73	FA-A74
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
Percent Moisture:	20	19	22	26	20	19	
Location and/or Sample Description:	SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	GW-12
					Background Sample	Background Sample	

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Phenol	108-95-2	BNA									350	U	330	U		
bis(2-Chloroethyl)Ether	111-44-4	BNA									350	U	330	U		
2-Chlorophenol	95-57-8	BNA									350	U	330	U		
1,3-Dichlorobenzene	541-73-1	BNA									350	U	330	U		
1,4-Dichlorobenzene	106-46-7	BNA									350	U	330	U		
1,2-Dichlorobenzene	95-50-1	BNA									350	U	330	U		
2-Methylphenol	95-48-7	BNA									350	U	330	U		
2,2'-Oxybis(1-Chloropropane)	108-60-1	BNA									350	U	330	U		
4-Methylphenol	106-44-5	BNA									350	U	330	U		
N-Nitroso-Di-n-Propylamine	621-64-7	BNA									350	U	330	U		
Hexachloroethane	67-72-1	BNA									350	U	330	U		
Nitrobenzene	98-95-3	BNA									350	U	330	U		
Isophorone	78-59-1	BNA									350	U	330	U		
2-Nitrophenol	88-75-5	BNA									350	U	330	U		
2,4-Dimethylphenol	105-67-9	BNA									350	U	330	U		
bis(2-Chloroethoxy)Methane	111-91-1	BNA									350	U	330	U		
2,4-Dichlorophenol	120-83-2	BNA									350	U	330	U		
1,2,4-Trichlorobenzene	120-82-1	BNA									350	U	330	U		
Naphthalene	91-20-3	BNA									350	U	330	U		
4-Chloroaniline	106-47-8	BNA									350	U	330	U		
Hexachlorobutadiene	87-68-3	BNA									350	U	330	U		
4-Chloro-3-Methylphenol	59-50-7	BNA									350	U	330	U		
2-Methylnaphthalene	91-57-6	BNA									350	U	330	U		
Hexachlorocyclopentadiene	77-47-4	BNA									350	U	330	U		
2,4,6-Trichlorophenol	88-06-2	BNA									350	U	330	U		
2,4,5-Trichlorophenol	95-95-4	BNA									860	U	810	U		
2-Chloronaphthalene	91-58-7	BNA									350	U	330	U		
2-Nitroaniline	88-74-4	BNA									860	U	810	U		
Dimethyl Phthalate	131-11-3	BNA									350	U	330	U		
Acenaphthylene	208-96-8	BNA									350	U	330	U		
2,6-Dinitrotoluene	606-20-2	BNA									350	U	330	U		
3-Nitroaniline	99-09-2	BNA									860	U	810	U		
Acenaphthene	83-32-9	BNA									350	U	330	U		

LEGEND

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:	FA-A68	FA-A69	FA-A70	FA-A71	FA-A72	FA-A73	FA-A74
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
Percent Moisture:	20	19	22	26	20	19	
Location and/or Sample Description:	SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	GW-12
					Background Sample	Background Sample	

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
2,4-Dinitrophenol	51-28-5	BNB									860	U	810	U
4-Nitrophenol	100-02-7	BNB									860	U	810	U
Dibenzofuran	132-64-9	BNB									350	U	330	U
2,4-Dinitrotoluene	121-14-2	BNB									350	U	330	U
Diethylphthalate	84-66-2	BNB									350	U	330	U
4-Chlorophenyl-phenylether	7005-72-3	BNB									350	U	330	U
Fluorene	86-73-7	BNB									350	U	330	U
4-Nitroaniline	100-01-6	BNB									860	U	810	U
4,6-Dinitro-2-Methylphenol	534-52-1	BNB									860	U	810	U
N-Nitrosodiphenylamine(1)	86-30-6	BNB									350	U	330	U
4-Bromophenyl-phenylether	101-55-3	BNB									350	U	330	U
Hexachlorobenzene	118-74-1	BNB									350	U	330	U
Pentachlorophenol	87-86-5	BNB									860	U	810	U
Phenanthrene	85-01-8	BNB									350	U	330	U
Anthracene	120-12-7	BNB									350	U	330	U
Carbazole	86-74-8	BNB									350	U	330	U
Di-n-Butylphthalate	84-74-2	BNB									350	U	330	U
Fluoranthene	206-44-0	BNB									350	U	330	U
Pyrene	129-00-0	BNB									350	U	330	U
Butylbenzylphthalate	85-68-7	BNB									350	U	330	U
3,3'-Dichlorobenzidine	91-94-1	BNB									350	U	330	U
Benzo(a)Anthracene	56-55-3	BNB									350	U	330	U
Chrysene	218-01-9	BNB									350	U	330	U
bis(2-Ethylhexyl)Phthalate	117-81-7	BNB									350	U	330	U
Di-n-Octyl Phthalate	117-84-0	BNB									350	U	330	U
Benzo(b)Fluoranthene	205-99-2	BNB									350	U	330	U
Benzo(k)Fluoranthene	207-08-9	BNB									350	U	330	U
Benzo(a)Pyrene	50-32-8	BNB									350	U	330	U
Indeno(1,2,3-cd)Pyrene	193-39-5	BNB									350	U	330	U
Bibenz(a,h)Anthracene	53-70-3	BNB									350	U	330	U
Benzo(g,h,i)Perylene	191-24-2	BNB									350	U	330	U

LEGEND

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A75	FA-A76	FA-A77	FA-A78	FA-A79		
WATER	WATER	WATER	WATER	WATER		
GW-13	GW-14	L-15	GW-17	GW-20		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Phenol	108-95-2	BNA												
bis(2-Chloroethyl)Ether	111-44-4	BNA												
2-Chlorophenol	95-57-8	BNA												
1,3-Dichlorobenzene	541-73-1	BNA												
1,4-Dichlorobenzene	106-46-7	BNA												
1,2-Dichlorobenzene	95-50-1	BNA												
2-Methylphenol	95-48-7	BNA												
2,2'-Oxybis(1-Chloropropane)	108-60-1	BNA												
4-Methylphenol	106-44-5	BNA												
N-Nitroso-Di-n-Propylamine	621-64-7	BNA												
Hexachloroethane	67-72-1	BNA												
Nitrobenzene	98-95-3	BNA												
Isophorone	78-59-1	BNA												
2-Nitrophenol	88-75-5	BNA												
2,4-Dimethylphenol	105-67-9	BNA												
bis(2-Chloroethoxy)Methane	111-91-1	BNA												
2,4-Dichlorophenol	120-83-2	BNA												
1,2,4-Trichlorobenzene	120-82-1	BNA												
Naphthalene	91-20-3	BNA												
4-Chloroaniline	106-47-8	BNA												
Hexachlorobutadiene	87-68-3	BNA												
4-Chloro-3-Methylphenol	59-50-7	BNA												
2-Methylnaphthalene	91-57-6	BNA												
Hexachlorocyclopentadiene	77-47-4	BNA												
2,4,6-Trichlorophenol	88-06-2	BNA												
2,4,5-Trichlorophenol	95-95-4	BNA												
2-Chloronaphthalene	91-58-7	BNA												
2-Nitroaniline	88-74-4	BNA												
Dimethyl Phthalate	131-11-3	BNA												
Acenaphthylene	208-96-8	BNA												
2,6-Dinitrotoluene	606-20-2	BNA												
3-Nitroaniline	99-09-2	BNA												
Acenaphthelene	83-32-9	BNA												

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368
Case Number: 20267
Concentrations in micrograms/kilogram (ug/kg) or ug/l.
Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A75	FA-A76	FA-A77	FA-A78	FA-A79		
WATER	WATER	WATER	WATER	WATER		
GW-13	GW-14	L-15	GW-17	GW-20		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
2,4-Dinitrophenol	51-28-5	BNA												
4-Nitrophenol	100-02-7	BNA												
Dibenzofuran	132-64-9	BNA												
2,4-Dinitrotoluene	121-14-2	BNA												
Diethylphthalate	84-66-2	BNA												
4-Chlorophenyl-phenylether	7005-72-3	BNA												
Fluorene	86-73-7	BNA												
4-Nitroaniline	100-01-6	BNA												
4,6-Dinitro-2-Methylphenol	534-52-1	BNA												
N-Nitrosodiphenylamine(1)	86-30-6	BNA												
4-Bromophenyl-phenylether	101-55-3	BNA												
Hexachlorobenzene	118-74-1	BNA												
Pentachlorophenol	87-86-5	BNA												
Phenanthrene	85-01-8	BNA												
Anthracene	120-12-7	BNA												
Carbazole	86-74-8	BNA												
Di-n-Butylphthalate	84-74-2	BNA												
Fluoranthene	206-44-0	BNA												
Pyrene	129-00-0	BNA												
Butylbenzylphthalate	85-68-7	BNA												
3,3'-Dichlorobenzidine	91-94-1	BNA												
Benzo(a)Anthracene	56-55-3	BNA												
Chrysene	218-01-9	BNA												
bis(2-Ethylhexyl)Phthalate	117-81-7	BNA												
Di-n-Octyl Phthalate	117-84-0	BNA												
Benzo(b)Fluoranthene	205-99-2	BNA												
Benzo(k)Fluoranthene	207-08-9	BNA												
Benzo(a)Pyrene	50-32-8	BNA												
Indeno(1,2,3-cd)Pyrene	193-39-5	BNA												
Bibenz(a,h)Anthracene	53-70-3	BNA												
Benzo(g,h,i)Perylene	191-24-2	BNA												

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368
Case Number: 20267
Concentrations in micrograms/kilogram (ug/kg) or ug/l.
Compiled by: Fluor Daniel, Inc.

Traffic Number:	FA-A59	FA-A60	FA-A63	FA-A64	FA-A65	FA-A66	FA-A67
Matrix:	WATER	WATER	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Moisture:			20	17	19	19	14
Location and/or Sample Description:	GW-16	GW-18 Background	SS-01	SS-02	SS-03	SS-04	SS-05

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
alpha-BHC	319-84-6	PEST/PCB			0.05	U								
beta-BHC	319-85-7	PEST/PCB			0.05	U								
delta-BHC	319-86-8	PEST/PCB			0.05	U								
gamma-BHC(Lindane)	58-89-9	PEST/PCB			0.05	U								
Heptachlor	76-44-8	PEST/PCB			0.05	U								
Aldrin	309-00-2	PEST/PCB			0.05	U								
Heptachlor epoxide	1024-57-3	PEST/PCB			0.05	U								
Endosulfan I	959-98-8	PEST/PCB			0.05	U								
Dieldren	60-57-1	PEST/PCB			0.10	U								
4,4'-DDE	72-55-9	PEST/PCB			0.10	U								
Endrin	72-20-8	PEST/PCB			0.10	U								
Endosulfan II	33213-65-9	PEST/PCB			0.10	U								
4,4'-DDD	72-54-8	PEST/PCB	0.10	U	0.10	U	3.3	U	4.9	J	3.5	U	3.5	U
Endosulfan sulfate	1031-07-8	PEST/PCB			0.10	U								
4,4'-DDT	50-29-3	PEST/PCB			0.10	U								
Methoxychlor	72-43-5	PEST/PCB			0.50	U								
Endrin ketone	53494-70-5	PEST/PCB	0.10	U	0.10	U	3.3	U	3.6	U	3.5	U	3.5	U
Endrin aldehyde	7421-93-4	PEST/PCB			0.10	U								
alpha-Chlordane	5103-71-9	PEST/PCB			0.05	U								
gamma-Chlordane	5103-74-2	PEST/PCB			0.05	U								
Toxaphene	8001-35-2	PEST/PCB			5.0	U								
Aroclor-1016	12674-11-2	PEST/PCB			1.0	U								
Aroclor-1221	11104-28-2	PEST/PCB			2.0	U								
Aroclor-1232	11141-16-5	PEST/PCB			1.0	U								
Aroclor-1242	53469-21-9	PEST/PCB			1.0	U								
Aroclor-1248	12672-29-6	PEST/PCB			1.0	U								
Aroclor-1254	11097-69-1	PEST/PCB			1.0	U								
Aroclor-1260	11096-82-5	PEST/PCB	1.0	U	1.0	U	33	U	39	J	35	U	35	U

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A68	FA-A69	FA-A70	FA-A71	FA-A72	FA-A73	FA-A74
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
17	19	22	27	19	18	
SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	GW-12
				Background Sample	Background Sample	

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
alpha-BHC	319-84-6	PEST/PCB									1.9 U		1.8 U	
beta-BHC	319-85-7	PEST/PCB									1.9 U		1.8 U	
delta-BHC	319-86-8	PEST/PCB									1.9 U		1.8 U	
gamma-BHC(Lindane)	58-89-9	PEST/PCB									1.9 U		1.8 U	
Heptachlor	76-44-8	PEST/PCB									1.9 U		1.8 U	
Aldrin	309-00-2	PEST/PCB									1.9 U		1.8 U	
Heptachlor epoxide	1024-57-3	PEST/PCB									1.9 U		1.8 U	
Endosulfan I	959-98-8	PEST/PCB									1.9 U		1.8 U	
Dieldren	60-57-1	PEST/PCB									3.6 U		3.5 U	
4,4'-DDE	72-55-9	PEST/PCB									3.6 U		3.5 U	
Endrin	72-20-8	PEST/PCB									3.6 U		3.5 U	
Endosulfan II	33213-65-9	PEST/PCB									3.6 U		3.5 U	
4,4'-DDD	72-54-8	PEST/PCB	3.6 U		3.4 U		3.6 U		4.0 U		3.6 U		3.5 U	0.10 U
Endosulfan sulfate	1031-07-8	PEST/PCB									3.6 U		3.5 U	
4,4'-DDT	50-29-3	PEST/PCB									3.6 U		3.5 U	
Methoxychlor	72-43-5	PEST/PCB									19 U		18 U	
Endrin ketone	53494-70-5	PEST/PCB	5.0 J		3.4 U		3.6 U		4.0 U		3.6 U		3.5 U	0.10 U
Endrin aldehyde	7421-93-4	PEST/PCB									3.6 U		3.5 U	
alpha-Chlordane	5103-71-9	PEST/PCB									1.9 U		1.8 U	
gamma-Chlordane	5103-74-2	PEST/PCB									1.9 U		1.8 U	
Toxaphene	8001-35-2	PEST/PCB									190 U		180 U	
Aroclor-1016	12674-11-2	PEST/PCB									36 U		35 U	
Aroclor-1221	11104-28-2	PEST/PCB									74 U		71 U	
Aroclor-1232	11141-16-5	PEST/PCB									36 U		35 U	
Aroclor-1242	53469-21-9	PEST/PCB									36 U		35 U	
Aroclor-1248	12672-29-6	PEST/PCB									36 U		35 U	
Aroclor-1254	11097-69-1	PEST/PCB									36 U		35 U	
Aroclor-1260	11096-82-5	PEST/PCB	49 J		34 U		36 U		40 U		36 U		35 U	1.0 U

LEGEND

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NJ - Presumptive evidence of the presence of the material at an estimated quantity.

UJ - The material was analyzed for, but was not detected. The sample quantitation limit is an estimated quantity.

CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg) or ug/l.

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A75	FA-A76	FA-A77	FA-A78	FA-A79		
WATER	WATER	WATER	WATER	WATER		
GW-13	GW-14	L-15	GW-17	GW-20		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
alpha-BHC	319-84-6	PEST/PCB												
beta-BHC	319-85-7	PEST/PCB												
delta-BHC	319-86-8	PEST/PCB												
gamma-BHC(Lindane)	58-89-9	PEST/PCB												
Heptachlor	76-44-8	PEST/PCB												
Aldrin	309-00-2	PEST/PCB												
Heptachlor epoxide	1024-57-3	PEST/PCB												
Endosulfan I	959-98-8	PEST/PCB												
Dieldren	60-57-1	PEST/PCB												
4,4'-DDE	72-55-9	PEST/PCB												
Endrin	72-20-8	PEST/PCB												
Endosulfan II	33213-65-9	PEST/PCB												
4,4'-DDD	72-54-8	PEST/PCB	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U		
Endosulfan sulfate	1031-07-8	PEST/PCB												
4,4'-DDT	50-29-3	PEST/PCB												
Methoxychlor	72-43-5	PEST/PCB												
Endrin ketone	53494-70-5	PEST/PCB	0.10	U	0.10	U	0.10	U	0.10	U	0.10	U		
Endrin aldehyde	7421-93-4	PEST/PCB												
alpha-Chlordane	5103-71-9	PEST/PCB												
gamma-Chlordane	5103-74-2	PEST/PCB												
Toxaphene	8001-35-2	PEST/PCB												
Aroclor-1016	12674-11-2	PEST/PCB												
Aroclor-1221	11104-28-2	PEST/PCB												
Aroclor-1232	11141-16-5	PEST/PCB												
Aroclor-1242	53469-21-9	PEST/PCB												
Aroclor-1248	12672-29-6	PEST/PCB												
Aroclor-1254	11097-69-1	PEST/PCB												
Aroclor-1260	11096-82-5	PEST/PCB	1.0	U	1.0	U	1.0	U	1.0	U	1.0	U		

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location and/or
Sample
Description:

FA-A59	FA-A60	FA-A63	FA-A64	FA-A65	FA-A66	FA-A67
WATER	WATER	SOIL	SOIL	SOIL	SOIL	SOIL
18	21	21	14	16		
GW-16	GW-18	SS-01	SS-02	SS-03	SS-04	SS-05

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Unknown	75-43-4	VOC												
Bromofluorobenzene Isomer		TIC												
Dichlorofluoromethane		TIC												
		BNA												
Unknown	100-52-7	TIC			100	J	100	J	120	J	100	J	74	J
C6.H10.O2 Isomer		TIC			220	BJ	260	BJ	140	BJ	160	J		
Unknown		TIC			110	BJ	130	BJ	79	BJ	94	BJ	76	BJ
Benzaldehyde		TIC			75	BJ	75	BJ						
Unknown		TIC			280	BJ	250	J	180	BJ	210	J	480	BJ
Unknown		TIC			300	BJ	250	J	430	BJ	84	J		
Unknown HC		TIC			180	J			88	J	86	J		
Unknown HC		TIC			170	J			91	J	99	J		
Unknown		TIC			3700	J			77	J	400	BJ		
Unknown		TIC			220	J			1100	J	730	J		
Unknown		TIC			250	J			140	J				
Unknown		TIC			72	J			190	J				
Unknown		TIC			110	J								
Unknown		TIC			86	J							230	J
Unknown HC		TIC							110	J	100	J	170	J
Unknown HC		TIC							240	J	150	J	84	J
Unknown HC		TIC							140	J			360	J
Unknown HC		TIC							210	J			120	J
Unknown HC		TIC							140	J			160	J
Unknown HC		TIC							200	J				
		TIC											190	J
		TIC												
		TIC												
		TIC												
		TIC												
		TIC												

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368
Case Number: 20267
Concentrations in micrograms/kilogram (ug/kg)
Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location and/or Sample Description:

FA-A68	FA-A69	FA-A70	FA-A71	FA-A72	FA-A73	FA-A74
SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	WATER
20	19	22	26	20	19	
SS-06	SS-07	SS-08	SS-09	SS-10	SS-11	GW-12

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
Unknown	75-43-4	VOC												
Bromofluorobenzene isomer		TIC	87	J										
Dichlorofluoromethane		TIC	59	J										
		TIC												
Unknown	100-52-7	BNA												
		TIC	83	J	140	J	80	J	170	J	180	J		
C6.H10.O2 Isomer		TIC			300	BJ	91	BJ				300	BJ	
Unknown		TIC	74	BJ	160	BJ	110	BJ	110	BJ	80	BJ	120	BJ
Benzaldehyde		TIC												
Unknown		TIC	330	BJ	110	J	89	BJ	200	BJ	90	BJ	260	BJ
Unknown		TIC	88	J	330	J	180	BJ	450	BJ	530	BJ	440	BJ
Unknown HC		TIC	140	J			100	J	96	J	73	J	300	J
Unknown HC		TIC	140	J					100	J	160	J	580	J
Unknown		TIC	230	J	78	J	600	BJ	260	J	5600	J	220	J
Unknown		TIC			84	J	2700	J	140	J	200	J	1600	J
Unknown		TIC			320	BJ	180	J	4400	J	270	J	310	J
Unknown		TIC							110	J			410	J
Unknown		TIC							160	J			250	J
Unknown		TIC							330	J			290	J
Unknown HC		TIC	130	J					350	J	170	J	580	J
Unknown HC		TIC	200	J					440	J	110	J		
Unknown HC		TIC												
Unknown HC		TIC											620	J
Unknown HC		TIC												
2,3-Dichloro-2-Methylbutane	507-45-9	TIC			150	J	89	J	180	J				
Hexadecanoic acid	57-10-3	TIC										730	J	
Unknown acid		TIC										180	J	
Unknown		TIC										14000	J	
Unknown		TIC										3300	J	
Unknown		TIC										700	J	
Unknown		TIC										240	J	
Unknown		TIC										350	J	

LEGEND

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CHEMICAL DATA SUMMARY

Site Name and Code: Castle Miles LF TXD 980750368

Case Number: 20267

Concentrations in micrograms/kilogram (ug/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:
Matrix:
Percent Moisture:
Location
and/or
Sample
Description:

FA-A75	FA-A76	FA-A77	FA-A78	FA-A79		
WATER	WATER	WATER	WATER	WATER		
GW-13	GW-14	L-15	GW-17	GW-20		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
		VOC														
Unknown		TIC	15	J	15	J										
Bromofluorobenzene isomer		TIC														
Dichlorofluoromethane	75-43-4	TIC	12	J	11	J										
		BNA														
Unknown		TIC	89	J	53	J			9	J						
C10.H20 Isomer		TIC			2	J			2	J						
Unknown		TIC	16	J	10	J			4	J						
Benzaldehyde	100-52-7	TIC														
Unknown		TIC	3	J	3	J			7	J						
Unknown		TIC	8	J	21	J			3	J						
Unknown		TIC	39	J	8	J			10	J						
Unknown		TIC	4	J					2	J						
1,2-Diiodoethane	624-73-7	TIC	3	J	3	J			4	J						
Unknown		TIC							5	J						
Unknown		TIC							4	J						
Sulfur	10544-50-0	TIC	7	J					4	J						
Hexanoic acid isomer		TIC							3	J						
Iodophenol isomer		TIC							2	J						
Butoxyethoxy-Ethanol isomer		TIC							2	J						
Acetylmorpholine isomer		TIC							3	J						
N,N-Diethyl-3-Methylbenzamide	134-62-3	TIC							8	J						
2(3H)-Benzothiazolone	934-34-9	TIC							6	J						
N-Ethyl-4-Methylbenzenesulfo	80-39-7	TIC							3	J						
N-Butylbenzenesulfonamide	3622-84-2	TIC							7	J						
2,4,6-Trilodophenol	609-23-4	TIC							3	J						
1-Chloro-5-Iodopentane	60274-60-4	TIC	10	J												
Unknown		TIC														
Unknown		TIC														
Unknown		TIC														
Unknown		TIC														
Unknown		TIC														

LEGEND

U - The material was analyzed for, but was not detected. The associated numerical value is the sample quantitation limit.

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Reference 13

**Federal Emergency Management Agency, Flood Insurance
Rate Maps, Garland, Texas, Community-Panel Number
485471
0010 D & 0020 D, Maps Revised Date August 15, 1990.**



APPROXIMATE SCALE

1000 0 1000 FEET

13-1

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
GARLAND, TEXAS
DALLAS AND COLLIN COUNTIES

PANEL 10 OF 30

(SEE MAP INDEX FOR PANELS NOT PRINTED)



PANEL LOCATION

COMMUNITY-PANEL NUMBER

485471 0010 D

MAP REVISED:

AUGUST 15, 1990



Federal Emergency Management Agency

13,1

13-2

NATIONAL FLOOD INSURANCE PROGRAM**FIRM**
FLOOD INSURANCE RATE MAP**CITY OF**
GARLAND, TEXAS
DALLAS AND COLLIN COUNTIES**PANEL 20 OF 30**

(SEE MAP INDEX FOR PANELS NOT PRINTED)



PANEL LOCATION

COMMUNITY-PANEL NUMBER
485471 0020 D**MAP REVISED:**
AUGUST 15, 1990

Federal Emergency Management Agency

13,2

F

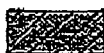
13-3

LEGEND



SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A** No base flood elevations determined.
- ZONE AE** Base flood elevations determined.
- ZONE AH** Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO** Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding; velocities also determined.
- ZONE A99** To be protected from 100-year flood by Federal flood protection system under construction; no base flood elevations determined.
- ZONE V** Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE** Coastal flood with velocity hazard (wave action); base flood elevations determined.

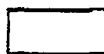


FLOODWAY AREAS IN ZONE AE



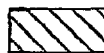
OTHER FLOOD AREAS

- ZONE X** Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.



OTHER AREAS

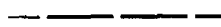
- ZONE X** Areas determined to be outside 500-year floodplain.
- ZONE D** Areas in which flood hazards are undetermined.



UNDEVELOPED COASTAL BARRIERS



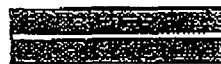
Floodplain Boundary



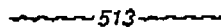
Floodway Boundary



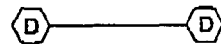
Zone D Boundary



Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.



Base Flood Elevation Line; Elevation in Feet*



Cross Section Line

(EL 987)

Base Flood Elevation in Feet Where Uniform Within Zone*

RM 7x

Elevation Reference Mark

•M1.5

River Mile

*Referenced to the National Geodetic Vertical Datum of 1929

NOTES

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

KEYS ARE
IDENTICAL

13,3

13-4

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0 NGVD, and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Elevation reference marks are described in the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

MAP REPOSITORY

City Hall, Garland, Texas 75045-9002 (Maps available for reference only, not for distribution).

INITIAL IDENTIFICATION:
APRIL 16, 1971

FLOOD HAZARD BOUNDARY MAP REVISIONS:
NONE

FLOOD INSURANCE RATE MAP EFFECTIVE:
APRIL 16, 1971

FLOOD INSURANCE RATE MAP REVISIONS:

July 1, 1974 - to change zone designations.

October 3, 1975 - reflect curvilinear flood boundary, to change corporate limits, and to add special flood hazard areas.

November 1, 1979 - to change zone designations, to change special flood hazard areas, to change base flood elevations.

March 15, 1984 - to change corporate limits, to add new special flood hazard areas, to reduce special flood hazard areas, to change zone designations, to change base flood elevations, to change zone boundary line designations, to add street names and to add streets, to add special flood hazard areas dated 12/4/79 from the City of Richardson, Texas and 3/16/83 from the City of Dallas, Texas.

August 15, 1990 - to update corporate limits, to change base flood elevations, to change special flood hazard areas, to update map format, to add roads and road names, to incorporate previously issued letters of map revision, and to incorporate previously issued letters of map amendment.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

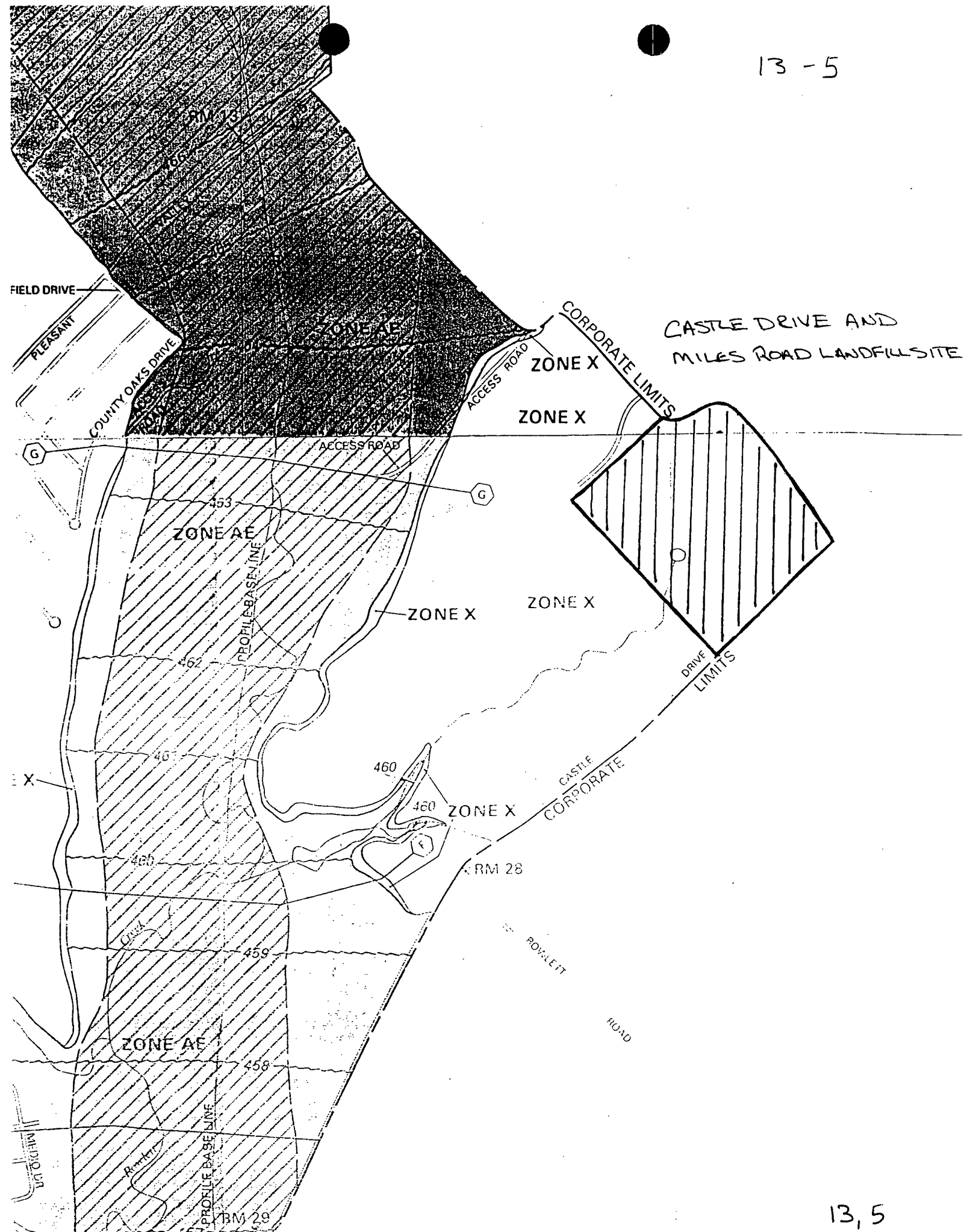


APPROXIMATE SCALE

1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

13.4



Reference 14

**Site Operating Plan (revised), City of Garland
Sanitation Department, October 19, 1992.**

14-1



City of Garland

Post Office Box 469002 / Garland, Texas 75046-9002

October, 19, 1992

MSW-1062A

Ron Bond
P. E. Director
Municipal Solid Waste Division

Dear Mr. Bond,

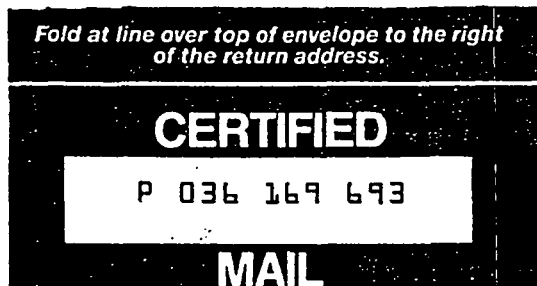
In response to your letter, dated October 7, 1992 requesting a revised Site Operating Plan (S.O.P.) reflecting the modification of the operating hours of the Garland landfill located at 3637 Castle, please replace pages 2, 3, and 4 from the original S.O.P. with pages 2, 3, and 4 of the revised Site Operating Plan (S.O.P.)

Thank you for your time and consideration.

Sincerely,

Harvey Stuart
Manager
Landfill and Transfer Operations

Enclosure



14,1

- E. Ensure that the area is policed and kept clean. Fences should be cleaned daily.
- F. Ensure all doors and gates are locked when the facility is closed.

III. PERSONNEL AND EQUIPMENT

In order to have adequate capability to conduct the landfill operations in conformance with the design and operational standards, Garland will have one landfill supervisor, one landfill foreman, five equipment operators, one landfill attendant and one scale attendant.

A Supervisor will be on site a minimum of 75% of the time that the landfill is open.

The following specific personnel will administrate and/or conduct the on site landfill operations:

Assistant Director of Solid Waste Services

- ① { Harvey Stuart
Employed - February 1970 to Present
Assistant Director of Solid Waste Services - 1982 to Present
Texas A, B, C, & D Certification and Class "A" letter of Competency.

Landfill Foreman and Supervisor Designate

- ② { Kenneth L. Pepper
Employed - July 1982 to Present
Landfill Foreman - February 1987 to Present
Texas A, B, C & D Certification and Class "A" Letter of Competency
Scraper Operator at Landfill since July 1982

Equipment Operators

- ③ { Donald E. Bailey
Employed - December 1976 to present
Dozer and Compactor Operator at landfill (July 1978 to Present)
- ④ { Carl Wafford
Employed - August 1973 to Present
Dozer and Compactor Operator at Landfill (April 1973 to Present)
- ⑤ { David Mitchell
Employed 8-23-87
Landfill Attendant 8-23-87 to 2-4-90
Equipment operator 2-4-90 to Present

- ⑥ { Mike Rosa
Employed 4-6-89
Landfill Attendant 4-6-89 to 12-9-90
Equipment operator 12-9-90 to present
- ⑦ { Hobert Robinett
Employed 1-15-91
Landfill Attendant 1-15-91 to 5-26-91
Equipment operator 5-26-91 to present

Landfill Attendants

- ⑧ { Mike Conrad
Employed 3-25-91
Landfill Attendant 3-25-91 to present
- ⑨ { Kevin Pool
Employed 7-10-91
Landfill Attendant 7-10-91 to present

Landfill Scales Attendant

- ⑩ { Drucilla Lawson
Employed - October 1977 to Present
Scale Attendant August 1979 to present

[Total 10 employees]

The following equipment which is owned by the City of Garland will provide adequate capability to conduct the operations in conformance with the design and operational standards.

<u>QUANTITY</u>	<u>DESCRIPTION</u>
1 - 1981	Chevrolet Pick-up
1 - 1982	Cat 826 Compactor
1 - 1986	Cat 826 Compactor
1 - 1982	Cat 623 Scraper
1 - 1981	Cat 623 Scraper
1 - 1974	Cat D7F Dozer
1 - 1989	Cat D8N Dozer
1 - 1978	12G Cat Grader
1 - 1982	6" Trash Pump
1 - 1974	4" Trash Pump
1 - 1985	6" Trash Pump
1 - 1983	Cat 623 Scraper
1 - 1991	Dodge P.U.

IV. SECURITY AND SAFETY

The site is currently fenced along Castle Drive with the exception of the site addition at the south corner (Area "G", Attachment No. 6). Fencing is also provided along Miles Road to discourage unauthorized entry to the site. Additional fencing will be provided for the new addition along Castle Drive. Access to the site is currently and will continue to be controlled by a gatehouse at the entrance and a lockable gate. The gate to the facility will be locked when the facility is closed. Additional site screening berms will be constructed along Castle Drive as the fill progresses to final elevation. (See Attachment 6E for berm detail).

A 4-foot by 4-foot sign with minimum 4-inch high letters will be erected stating that no Liquid or Hazardous waste will be accepted.

Operational hours for the facility will not exceed the following schedule and will be posted on a 4-foot by 4-foot sign with 3-inch letters as follows:

7:00 am to 7:00 pm Monday through Sunday

The following safety rules should be observed at all times:

- * All landfill personnel will wear safety shoes and leather gloves.
- * All landfill personnel will be furnished with hard hats, dust protectors, hearing protectors, and safety glasses.
- * In the interest of safety, children under the age of twelve (12) must remain in a vehicle while it is being unloaded.
- * Maintain at least six feet between unloading vehicles at the fill face.

Reference 15

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Ken Smith, Landfill Director, City of Garland
Sanitation Department, May 21, 1993.**

15-1

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters *WW* DATE: May 21, 1993

LOCATION: Irvine, CA TIME: 1:00 pm PST

TO: Ken Smith, Landfill Director, City of P.O. NO. 635336-41
Garland (214) 205-2713

LOCATION: Garland, TX OTHER REF. ARCS SI

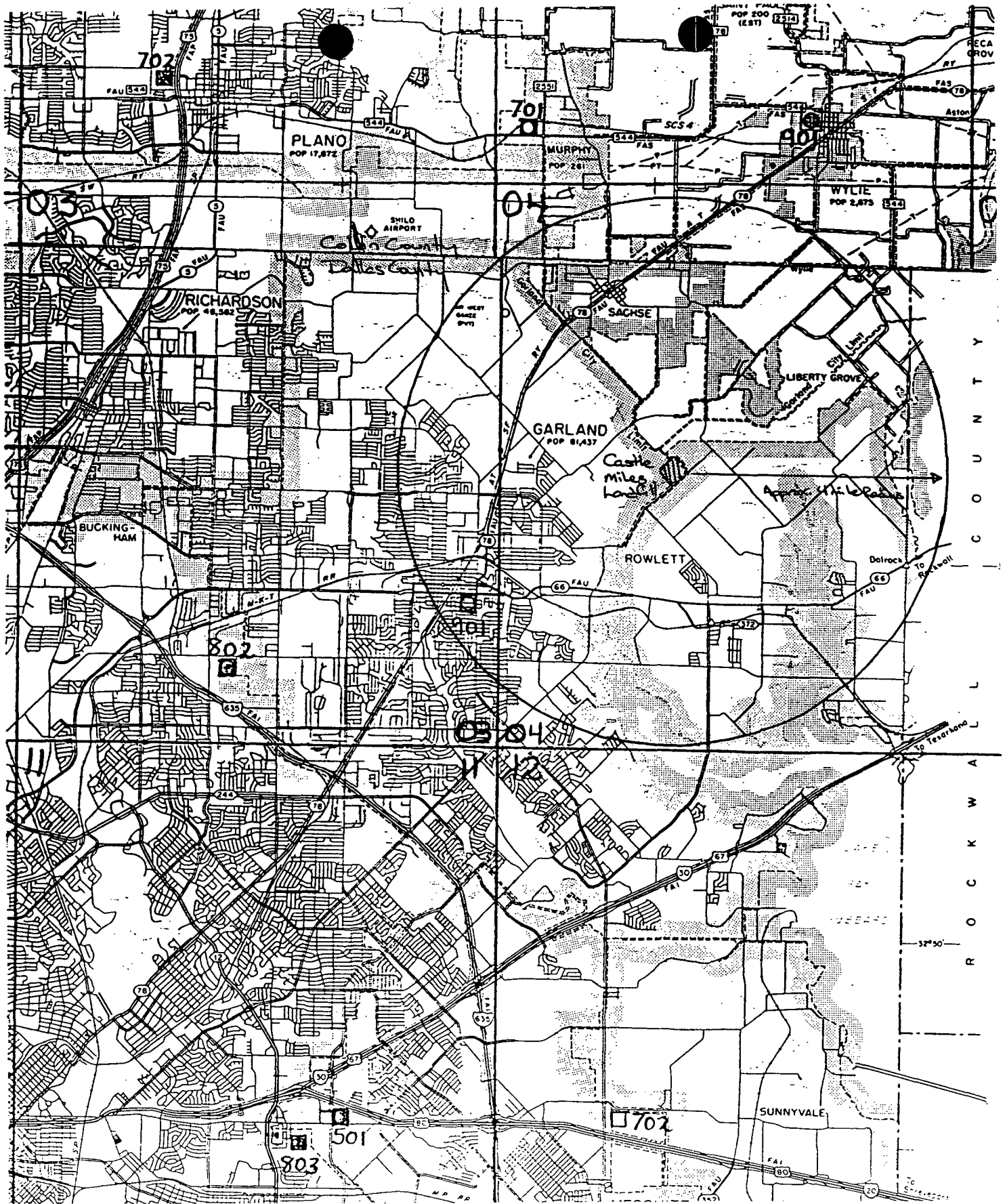
The following information items were discussed during this call:

1. Mr. Smith noted that there were not 13 monitoring wells on-site at the operating landfill (Castle Drive and Castle & Miles sites). Rather there were 11 monitoring wells and 3 wells that were used for a characterization study. These characterization study wells (CSWs) were drilled after high solids results from monitoring well (MW) number 10 were discovered. The CSWs are approximately: up gradient 10 feet from MW number 10 (CSW 10A), 100 feet down gradient from MW 10 (CSW 10B) and 220 feet down gradient from MW 10 (CSW 10C). These CSWs were drilled in July 1991. Mr. Smith also noted that MWs 3A and 8A are so designated because they had to be redrilled after being accidentally damaged by site equipment.
2. Mr. Smith was not sure if Vaughn McCallum has a ground water well but he did note that two nearby property owners (one north of the operating landfill on Castle Drive and one south on Castle) had ground water wells. He also noted that these wells were not currently used for drinking water, as these two residences were connected to the municipal water pipeline that runs along Castle Drive.
3. Mr. Smith was not aware of the existence of the two monitoring wells that were discovered on the Quail Creek landfill during the site reconnaissance.
4. Mr. Smith did not have any maps of the Quail Creek landfill site, showing the locations of the landfill cells, but he thought that the City of Garland Engineering Department may have these maps. He also did not know if the landfill cells were located inside or outside of the 500 year floodplain of Mills Branch that is adjacent to this landfill.

5. Mr. Smith noted that the cells in the Mills Road landfill do not extent to the City of Garland power right of way located on the northwest side of this property. He noted that the access road to the landfill was where the power right of way is now.
6. [Mr. Smith noted that the "old burning dump", that is adjacent to the operating landfill, burned and buried municipal wastes. He also noted that the "old burning dump" was closed in early 1968. He did not know when the "old burning dump" started operations.]
7. [Mr. Smith noted that the black and yellow clays on top of the Castle & Miles site are both 12 to 18 inches thick. The use of different clays was due to material availability.]
8. Mr. Smith noted that he believed that the Drum property (Miller Road Landfill) was considerably different in appearance from the Cannaday property because the Drums allowed other wastes to be laid after landfill closure. He thought that these wastes included road construction waste from the improvement of Centerville Road.

Reference 16

**Records of Wells, Springs, and Test Holes - Dallas County
and Collin County, Texas Water Development Board,
received 12/93.**



RECORDS OF WELLS, SPRINGS, AND TEST HOLES
COUNTY - Dallas

WELL	OWNER	LAT.	LONG.	SOURCE OF COORDS.	WATER BEARING UNIT	DEPTH OF WELL (FT.)	DATE COM- PLETED	WELL TYPE	USE OF WATER	WATER LEVEL AVAIL.	WATER QUAL. AVAIL.
33 02 405	(b) (6)	325656	965028	1	212WDBN	800	1937		H S	N	Y
33 02 406	LES LACS VILLAGE, INC.	325656	965104	3	218PLXY	1610	10 1982	W	I	N	N
33 02 701	City of Dallas	325249	965020	1	218PLXY	1638	11011956	W	U	N	N
33 02 902	Electronic Data System	325444	964656	3	212WDBN	1047	1973		I	N	Y
33 02 903	Electronic Data System	325445	964643	3	212WDBN	1031	1974		I	N	Y
33 02 904	City of Dallas	325253	964708	1	218TVPK	3053	1956	W	U	N	Y
33 02 905	Reynolds Childrens Home	325251	964541	1	212WDBN	1020	1927		U	N	N
33 02 906	Glen Lakes Country Club	325234	964558	1	212WDBN	1125	1939		U	N	N
33 03 201	Lone Star Cement Co	325818	964207	1	212WDBN	1277	1969		N	N	Y
33 03 204	Spring Park Dev.	325836	964032	1	212WDBN	1406	1977		I	N	N
33 03 401	City of Richardson	325716	964339	1	218TVPK	3333	1952		U	N	Y
33 03 402	City of Richardson	325716	964339	1	218PLXY	2068	1947		U	N	Y
33 03 403	Restland Memorial Park	325540	964441	3	212WDBN	1166	1939		U	N	N
33 03 404	City of Buckingham	325606	964329	1	212WDBN	1254	1950		P	N	Y
33 03 405	City of Richardson	325654	964344	1	218PLXY	1947	1925		U	N	Y
33 03 601	City of Garland	325501	963917	1	218TVPK	3540	1942		U	N	N
33 03 801	City of Garland	325404	964056	1	218TVPK	3488	1945		U	N	Y
33 03 802	(b) (6)	325339	964151	2	212WDBN	25	1900		U	H	Y
33 03 901	City of Garland	325443	963812	3	218TVPK	3689	1952		U	H	N - unused
33 03 902	City of Garland	325443	963812	3	218PLXY	2303	1922		U	N	Y - unused
33 03 903	City of Garland	325435	963945	1	218TVPK	3633	1942		U	N	Y
33 03 904	City of Garland	325336	963854	1	218TVPK	3626	1949		U	N	Y
33 03 905	City of Garland	325423	963826	1	218PLXY	2318	1936		U	N	Y
33 04 101		325844	963726	3	212WDBN	1388			S	N	Y - waters stock
33 04 801	City of Rowlett	325408	963354	1	218PLXY	2658	1954	W	P	N	Y - unused
33 09 101	City of Irving	325031	965819	1	218TVPK	2134	1954		U	N	Y

RECORDS OF WELLS, SPRINGS, AND TEST HOLES
COUNTY - Collin

page 5

WELL	OWNER	LAT.	LONG.	SOURCE OF COORDS.	WATER BEARING UNIT	DEPTH OF WELL (FT.)	DATE COM- PLETED	WELL TYPE	USE OF WATER	WATER LEVEL AVAIL.	WATER QUAL. AVAIL.
18 59 303	City of Allen Well No.3.	330559	963856	1	212WDBN	1483	12 1967	W	P	M	Y
18 59 501	H. Molsen Co.	330455	964035	1	212WDBN	1210	05151973	W	H N	M	Y
18 59 601	(b) (6)	330255	963801	2	212WDBN	1130	1984	W	I	N	Y
18 59 701	City of Plano	330118	964243	1	212WDBN	1180	03011932	W	U	M	Y
18 59 702	City of Plano	330118	964243	1	212WDBN	980	- -	W	U	H	Y
18 60 101	(b) (6)	330533	963719	1	211ASTN	26	- -	W	U	M	Y
18 60 102	(b) (6)	330518	963713	1	211ASTN	25	- -	W	H S	M	Y
18 60 103	(b) (6)	330508	963710	1	211ASTN	20	- -	W	H S	M	Y
18 60 301	Wilburn No.1.	330554	963221	4	NOT-APPL	4220	04031950	P	U	N	N
18 60 401	(b) (6)	330319	963543	1	211TYLR	12	1910	W	U	H	Y
18 60 601	United Fidelity Life Ins. Co.	330327	963019	1	212WDBN	1987	05201964	W	U	M	N
18 60 701	(b) (6)	330043	963646	1	211ASTN	60	1906	W	H	H	Y
18 60 901	Town of Wylie	330047	963221	1	218PLXY	2790	1923	W	U	H	Y
18 62 701	(b) (6)	330221	962228	2	211TYLR	50		W	H	H	N
33 02 205	Collins Radio Co.	325955	964840	1	218PLXY	1746	02 1968	W	H	M	N
33 02 301	Texas Research Foundation	325911	964556	1	218PLXY	1900	06041947	W	U	M	Y
33 02 302	Preston Highland	325935	964709	1	212WDBN	806	04041952	W	P	M	Y
33 02 304	City of Renner	325918	964609	1	212WDBN	1177	04 1957	W	P	N	Y
33 03 202	Owens Sausage Co.	325911	964151	1	218PLXY	2092	10 1961	W	N	M	Y
33 03 203	Richardson Golf Course	325942	964109	1	218TPVK	3288	09201972	W	I	M	Y

No wells in 04 Quadrant of Collin County

Reference 17

David M. Hershfield, Rainfall Frequency Atlas of the United States, Engineering Division, Soil Conservation Service, U.S. Department of Agriculture; Technical Paper No. 40, Publication date unknown.

U.S. DEPARTMENT OF COMMERCE
CUTLER H. HODGES, Secretary

✓
WEATHER BUREAU
F. W. REICHERDINGER, Chief

TECHNICAL PAPER NO. 40

RAINFALL FREQUENCY ATLAS OF THE UNITED STATES

for Durations from 30 Minutes to 24 Hours and
Return Periods from 1 to 100 Years

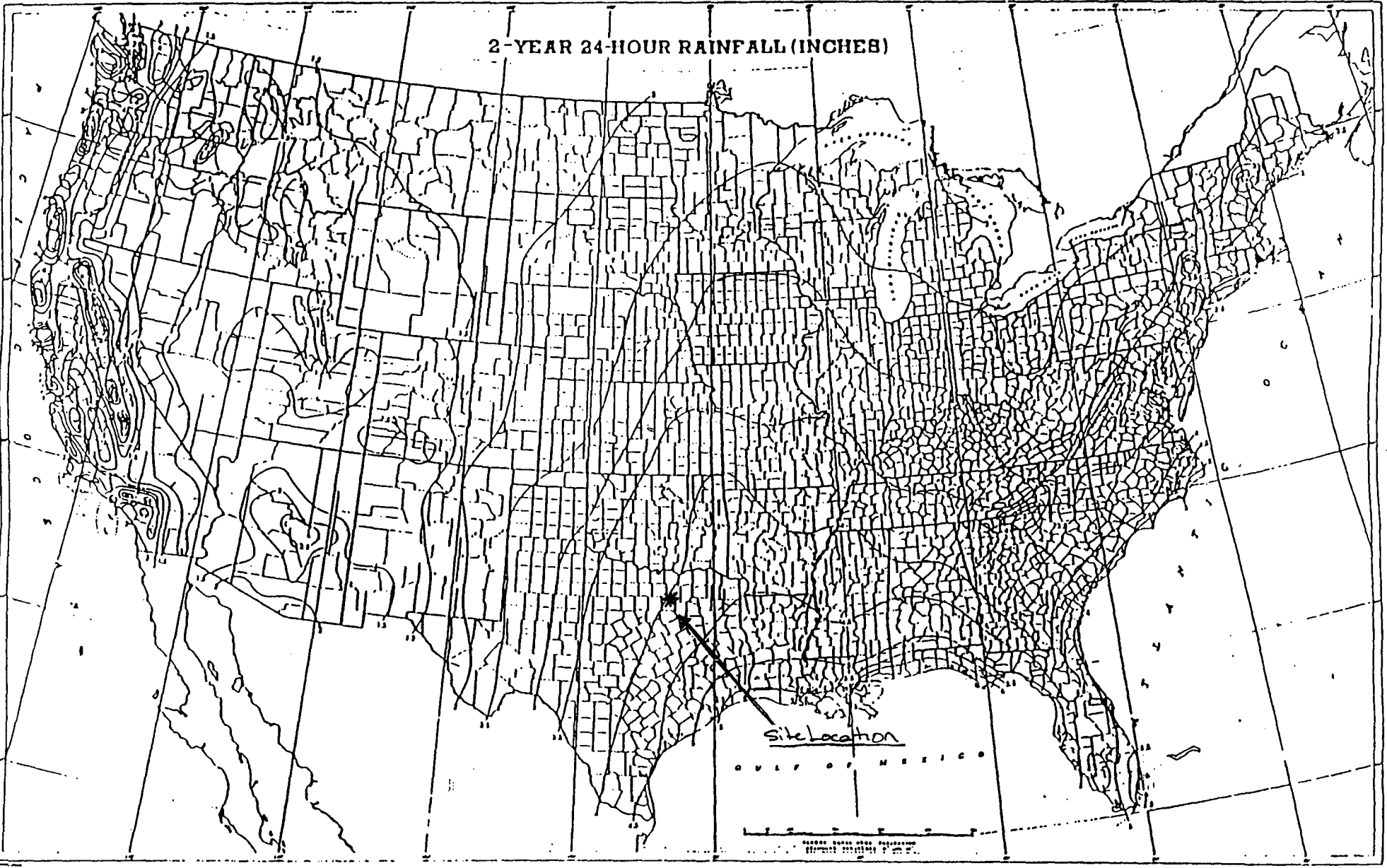
Prepared by
DAVID M. HERSHFIELD
Cooperative Studies Section, Hydrologic Services Division
for
Engineering Division, Soil Conservation Service
U.S. Department of Agriculture



17-1

17-1

2-YEAR 24-HOUR RAINFALL (INCHES)



Reference 18

**Soil Survey of Dallas County, Texas, United States
Department of Agriculture, Soil Conservation Service,
February, 1980.**

United States Department of Agriculture
Conservation Service
in cooperation with
Texas Agricultural Experiment Station



soil survey of

Dallas County, Texas

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than. Entries under "Erosion factors--T" apply to the entire profile. Absence of an entry indicates that data were not available or were not estimated]

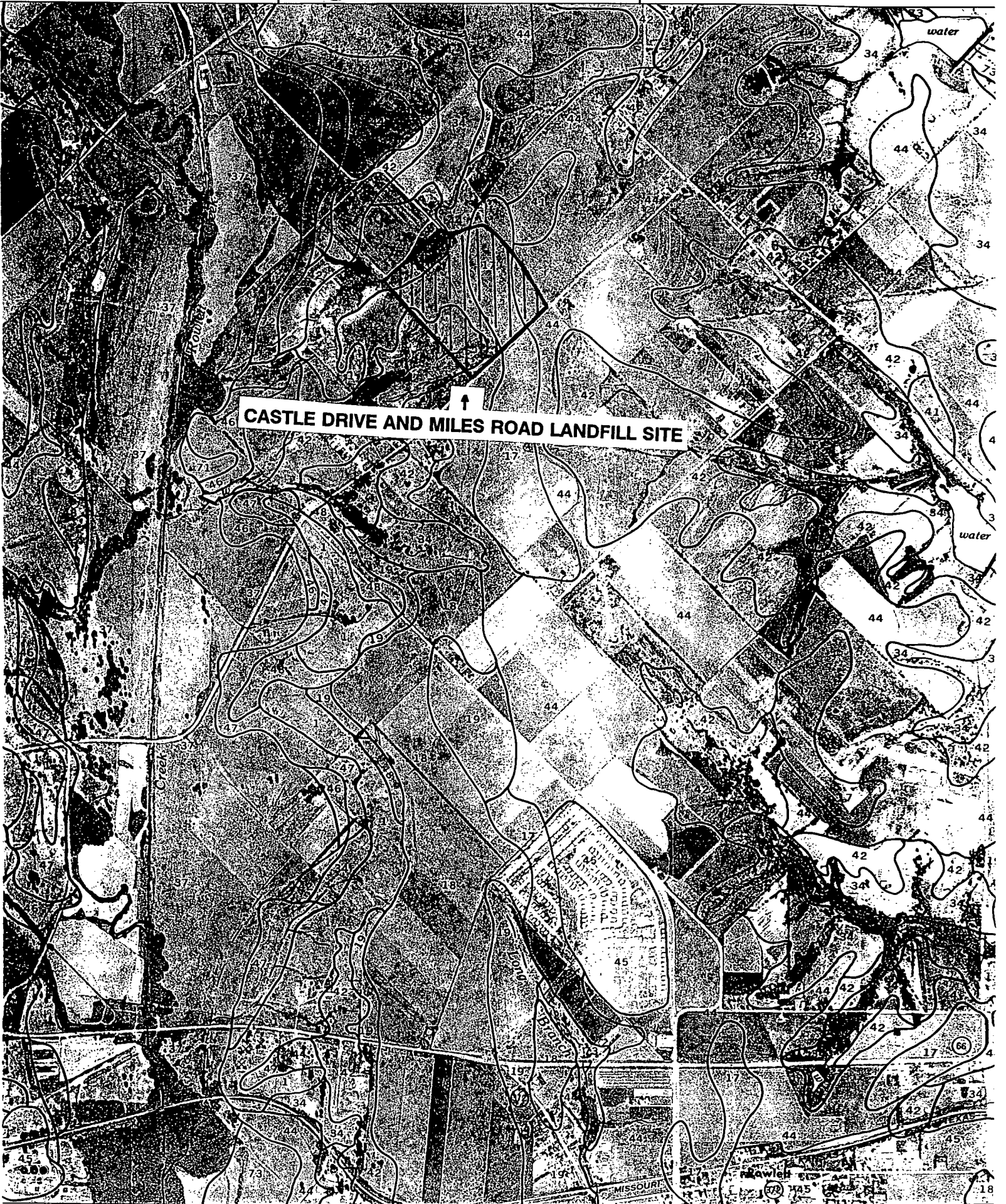
Soil name and map symbol	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
Altoga:	<u>in</u>	<u>in/hr</u>	<u>in/in</u>	<u>pH</u>					
1-----	0-25	0.6-2.0	0.15-0.18	7.9-8.4	High-----	High-----	Low-----	0.32	5
	25-80	0.6-2.0	0.15-0.18	7.9-8.4	Moderate	High-----	Low-----	0.32	
Arents:									
2, 3-----	0-80	---	---	---	---	---	---	---	---
4-----	0-80	---	---	7.9-8.4	High-----	High-----	Low-----	0.32	5
Austin:									
5, 6-----	0-10	0.2-0.6	0.15-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	2
	10-32	0.2-0.6	0.15-0.20	7.9-8.4	Moderate	High-----	Low-----	0.32	
	32-40	---	---	---	---	---	---	---	---
7:									
Austin part-----	0-10	0.2-0.6	0.15-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	2
	10-32	0.2-0.6	0.15-0.20	7.9-8.4	Moderate	High-----	Low-----	0.32	
	32-40	---	---	---	---	---	---	---	---
Lewisville part-----	0-15	0.6-2.0	0.16-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	5
	15-41	0.6-2.0	0.14-0.18	7.9-8.4	High-----	High-----	Low-----	0.37	
	41-75	0.6-2.0	0.14-0.18	7.9-8.4	High-----	High-----	Low-----	---	---
8:									
Austin part-----	0-10	0.2-0.6	0.15-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	2
	10-32	0.2-0.6	0.15-0.20	7.9-8.4	Moderate	High-----	Low-----	0.32	
	32-40	---	---	---	---	---	---	---	---
Urban land part.									
9:									
Austin part-----	0-10	0.2-0.6	0.15-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	2
	10-32	0.2-0.6	0.15-0.20	7.9-8.4	Moderate	High-----	Low-----	0.32	
	32-40	---	---	---	---	---	---	---	---
Urban land part.									
Axtell:									
10, 11, 12-----	0-8	0.6-2.0	0.11-0.15	5.1-6.5	Low-----	Moderate-----	Moderate-----	0.43	5
	8-80	<0.06	0.13-0.18	4.5-7.3	High-----	High-----	Moderate-----	0.37	
13:									
Axtell part-----	0-8	0.6-2.0	0.11-0.15	5.1-6.5	Low-----	Moderate-----	Moderate-----	0.43	5
	8-80	<0.06	0.13-0.18	4.5-7.3	High-----	High-----	Moderate-----	0.37	
Urban land part.									
Bastisil:									
14, 15-----	0-8	2.0-6.0	0.11-0.17	5.1-6.5	Low-----	Low-----	Low-----	0.24	5
	8-68	0.6-2.0	0.15-0.19	5.6-7.8	Moderate	Moderate-----	Low-----	0.32	
Brackett:									
16-----	0-16	0.2-0.6	0.10-0.20	7.9-8.4	Low-----	High-----	Low-----	0.32	2
	16-29	---	---	---	---	---	---	---	---
Branyon:									
17-----	0-80	<0.06	0.15-0.18	7.9-8.4	Very high	High-----	Low-----	0.32	5
Burleson:									
18, 19-----	0-64	<0.06	0.12-0.18	5.6-8.4	High-----	High-----	Low-----	---	4
	64-80	<0.06	0.12-0.18	7.4-8.4	High-----	High-----	Low-----	---	---

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	In	In/hr	In/in	pH					
Crockett:									
20, 21, 22-----	0-7	0.6-2.0	0.11-0.20	5.6-7.3	Low-----	Moderate-----	Low-----	0.43	5
	7-53	<0.06	0.14-0.18	5.6-7.8	High-----	High-----	Low-----	0.32	
	53-80	0.06-0.2	0.15-0.20	7.4-8.4	Moderate	High-----	Low-----	0.32	
Dalco:									
23, 24-----	0-35	<0.06	0.12-0.18	7.4-8.4	Very high	High-----	Low-----	0.32	3
Dutek:									
25-----	0-34	6.0-20	0.05-0.10	5.6-7.3	Very low	Low-----	Moderate-----	0.20	5
	34-54	0.6-2.0	0.12-0.17	5.1-6.0	Low-----	Moderate-----	Moderate-----	0.24	
	54-64	0.6-6.0	0.10-0.16	4.5-6.0	Low-----	Moderate-----	High-----	0.24	
	64-75	2.0-20	0.05-0.10	4.5-6.0	Very low	Low-----	High-----	0.20	
Eddy:									
26, 27-----	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low-----	High-----	Low-----	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low-----	High-----	Low-----	0.24	
	11-40	---	---	---	---	---	---	---	
28:									
Eddy part-----	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low-----	High-----	Low-----	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low-----	High-----	Low-----	0.24	
	11-40	---	---	---	---	---	---	---	
Brackett part---	0-16	0.2-0.6	0.10-0.20	7.9-8.4	Low-----	High-----	Low-----	0.32	2
	16-29	---	---	---	---	---	---	---	
29:									
Eddy part-----	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low-----	High-----	Low-----	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low-----	High-----	Low-----	0.24	
	11-40	---	---	---	---	---	---	---	
Brackett part---	0-16	0.2-0.6	0.10-0.20	7.9-8.4	Low-----	High-----	Low-----	0.32	2
	16-29	---	---	---	---	---	---	---	
Urban land part.									
30:									
Eddy part-----	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low-----	High-----	Low-----	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low-----	High-----	Low-----	0.24	
	11-40	---	---	---	---	---	---	---	
Stephen part---	0-14	0.2-0.6	0.10-0.15	7.9-8.4	Moderate	High-----	Low-----	0.32	1
	14-20	---	---	---	---	---	---	---	
31, 32:									
Eddy part-----	0-4	0.2-0.6	0.10-0.13	7.9-8.4	Low-----	High-----	Low-----	0.24	1
	4-11	0.2-0.6	0.03-0.07	7.9-8.4	Low-----	High-----	Low-----	0.24	
	11-40	---	---	---	---	---	---	---	
Urban land part.									
Eufaula:									
33-----	0-80	6.0-20.0	0.05-0.11	5.1-7.3	Low-----	Low-----	Moderate-----	0.17	5
Ferris:									
34:									
Ferris part-----	0-72	<0.06	0.15-0.18	7.9-8.4	Very high	High-----	Low-----	0.32	4
Heiden part-----	0-37	<0.06	0.15-0.20	7.9-8.4	Very high	High-----	Low-----	0.32	5
	37-78	<0.06	0.12-0.20	7.9-8.4	Very high	High-----	Low-----	0.32	
35:									
Ferris part-----	0-72	<0.06	0.15-0.18	7.9-8.4	Very high	High-----	Low-----	0.32	4

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Permeability	Available water capacity	Reaction	Shrink-swell potential	Risk of corrosion		Erosion factors	
						Uncoated steel	Concrete	K	T
	<u>In</u>	<u>In/hr</u>	<u>In/in</u>	<u>pH</u>					
Ferris: Urban land part.									
Frio: 36, 37-----	0-53 53-74	0.2-0.6 0.2-0.6	0.15-0.22 0.11-0.22	7.9-8.4 7.9-8.4	Moderate Moderate	High----- High-----	Low----- Low-----	---	---
38: Frio part-----	0-53 53-74	0.2-0.6 0.2-0.6	0.15-0.22 0.11-0.22	7.9-8.4 7.9-8.4	Moderate Moderate	High----- High-----	Low----- Low-----	---	---
Urban land part.									
Gowen: 39, 40-----	0-32 32-80	0.6-2.0 0.6-2.0	0.15-0.20 0.15-0.20	6.6-8.4 6.6-8.4	Moderate Moderate	Moderate----- Moderate-----	Low----- Low-----	---	---
Heiden: 41, 42-----	0-37 37-78	<0.06 <0.06	0.15-0.20 0.12-0.20	7.9-8.4 7.9-8.4	Very high Very high	High----- High-----	Low----- Low-----	0.32 0.32	5
Houston Black: 43, 44-----	0-6 6-70	<0.06 <0.06	0.15-0.20 0.15-0.20	7.4-8.4 7.4-8.4	Very high Very high	High----- High-----	Low----- Low-----	0.32 0.32	4
45: Houston Black part-----	0-6 6-70	<0.06 <0.06	0.15-0.20 0.15-0.20	7.4-8.4 7.4-8.4	Very high Very high	High----- High-----	Low----- Low-----	0.32 0.32	4
Urban land part.									
Lewisville: 46, 47, 48-----	0-15 15-41 41-75	0.6-2.0 0.6-2.0 0.6-2.0	0.16-0.20 0.14-0.18 0.14-0.18	7.9-8.4 7.9-8.4 7.9-8.4	High----- High----- High-----	High----- High----- High-----	Low----- Low----- Low-----	0.32 0.37 ---	5
49, 50: Lewisville part-----	0-15 15-41 41-75	0.6-2.0 0.6-2.0 0.6-2.0	0.16-0.20 0.14-0.18 0.14-0.18	7.9-8.4 7.9-8.4 7.9-8.4	High----- High----- High-----	High----- High----- High-----	Low----- Low----- Low-----	0.32 0.37 ---	5
Urban land part.									
Mabank: 51, 52-----	0-5 5-65	0.6-2.0 <0.06	0.11-0.15 0.12-0.18	5.6-7.3 5.6-8.4	Low----- High-----	Moderate----- High-----	Moderate----- Moderate-----	0.43 0.32	5
Normangee: 53-----	0-9 9-66 66-71	0.06-0.2 <0.06 <0.06	0.15-0.20 0.12-0.18 0.12-0.18	5.6-7.3 5.6-8.4 6.1-8.4	Moderate High----- High-----	High----- High----- High-----	Low----- Low----- Low-----	0.43 0.37 ---	3
Ovan: 54, 55-----	0-80	<0.06	0.15-0.20	7.9-8.4	High-----	High-----	Low-----	0.32	5
Pits and Dumps: 56.									
Rader: 57: Rader part-----	0-8 8-16 16-64	2.0-6.0 0.2-0.6 <0.06	0.10-0.15 0.12-0.18 0.12-0.18	4.5-6.5 4.5-5.5 4.5-6.5	Low----- Moderate High-----	Moderate----- High----- High-----	Moderate----- Moderate----- Moderate-----	0.32 0.32 0.32	5



↑
CASTLE DRIVE AND MILES ROAD LANDFILL SITE

Reference 19

**Record of Telephone Conversation between Tom Casabonne,
Fluor Daniel, and Rene Caraveo, Environmental Monitoring
Manager, City of Dallas Water Utilities, June 7, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION -

FROM: Tom Casabonne *TJC* DATE: 6-7-93
 LOCATION: Irvine, x6657 TIME: 15:00
 TO: Rene Caraveo, Envtl. Monit. Mgr. P.O. NO. _____
 LOCATION: Dallas, TX, (214) 670-0936 OTHER REF. Analysis

I had a couple of phone conversations with Mr. Caraveo today to follow up on a conversation I had with Terry Hodgins on 5-27-93. He told me that Dallas is the only municipality that takes water out of Lake Ray Hubbard. Water from that intake is mixed with water from two other sources (including Lake Tawakoni) and blended to serve 1.6 million people in Dallas. The blend of the water from the three different intakes is constantly varied, so there is no fixed ratio of water drawn from the three sources.

Lake Ray Hubbard covers approximately 22,745 surface acres, and the entire watershed covers about 301 square miles.

I also spoke with Lindy Bond, who works with Rene Caraveo. When we are sampling on Dallas property (within the take line of Lake Ray Hubbard), Lindy wants us to split our samples so they can test them as well. In order to duplicate our tests, he would like us to send information on our analytes, limits, and methodologies. Lindy Bond's phone number is (214) 670-0936, and his fax number is (714) 670-8056. I told him that this would take a couple of days, and I will check on it again when I'm back in Irvine on Thursday, 6-10-93.

Reference 20

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Terry Hodgins, Dallas Water Utilities,
Watershed Managment Group, May 27, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne TJC DATE: 5-27-93
LOCATION: Irvine, 552M TIME: 14:00
TO: Terry Hodgins, Watershed P.O. NO. _____
Management Group OTHER REF. Lake Ray Hubbard
LOCATION: Dallas, (214) 245-2946

I was trying to reach Rene Caraveo (Environmental Monitoring Supervisor) but he is on vacation until next week. Terry Hodgins took the call and told me that the City of Dallas has a water intake on the southwest corner of Lake Ray Hubbard, at the dam. He didn't know how many people were served by water from the lake, but he will try to find out and send me the information. He will also send a map with the take line on it.

Water from the lake is used primarily by residences, although some industries also use the water. A powerplant also takes up water and discharges it back into the lake. Terry didn't know how much surface water and groundwater recharges into the lake, but he will get information on the lake's "Surface Yield," which he will send to us along with the take line map and other info. he can obtain on water usage.

Terry said they would be interested in splitting samples with us when we are sampling in Garland. They had heard that Fluor Daniel was in that area a couple of weeks ago, and they are also gathering more info. I told him to get back to Will Walters on that.

Terry also gave me the number of Bob Parlin, Supervisor of the Purification Department, (214) 670-0919. Mr. Parlin stops work at 4:00 pm, but a lab worker said he would send us a pamphlet with information on their water quality tests.

Separately, I called the USGS at (210) 873-3000. They said that the person to speak to about flow rates is there from 7:30 to 11:00 am on weekdays. His name is Bill Reeves and his direct line is (210) 873-3027.

I also called Wayne McCasland (City of Garland, Engineering Supervisor, (214) 205-2186) about monitoring well locations at the Quail Creek Site. He said that if Ken Smith doesn't have that information, he doesn't have it either. He remembered staking in the locations 10 to 15 years ago, but that was the extent of his involvement. He will send a map showing the location of old landfill cells.

Reference 21

**Record of Telephone Conversation between Tom Casabonne,
Fluor Daniel, and Larry Brown, Dallas Water Utilities,
Planning, September 15, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne *TJC*

DATE: Sept. 15, '93

LOCATION: Irvine 552M

TIME: 12:17 PM

TO: Larry Brown, Dallas Water
Utilities - Planning

P.O. NO. _____

OTHER REF. Lake Ray Hubbard

LOCATION: Dallas, (214) 670-3216

I called Mr. Brown to ask how much water the utility takes out of the lake, on average. According to him, they take an average 70,000,000 gal/day (equivalent to an annual rate of 78,000 acre-ft/yr) on any given day of the year. The actual daily rate can vary from 0 to 160,000,000 gal/day. A typical summer day would take 100,000,000 gal from the lake, while a typical winter day would only take forty or fifty million gallons, or even less.

If the other lakes are included, the utility takes in a total average of 330,000,000 gal/day (equivalent to an annual rate of 370,000 acre-ft/yr).

Mr. Brown can also give estimates of the amount of water which other communities take out of Lewisville Lake. He was very cooperative and he would be an excellent resource for more information if we need it.

Reference 22

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Bobby Farquhar, State of Texas Parks and
Wildlife, August 31, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD DATE: 8/31 & 9/7, 1993
LOCATION: Irvine, CA TIME: 1:35 p.m. PST
TO: Bobby Farquhar, State of P.O. NO. 635336-41
Texas, Parks and Wildlife, (817)
732-0761 OTHER REF. Fish Productivity
LOCATION: Fort Worth, TX

August 31, 1993

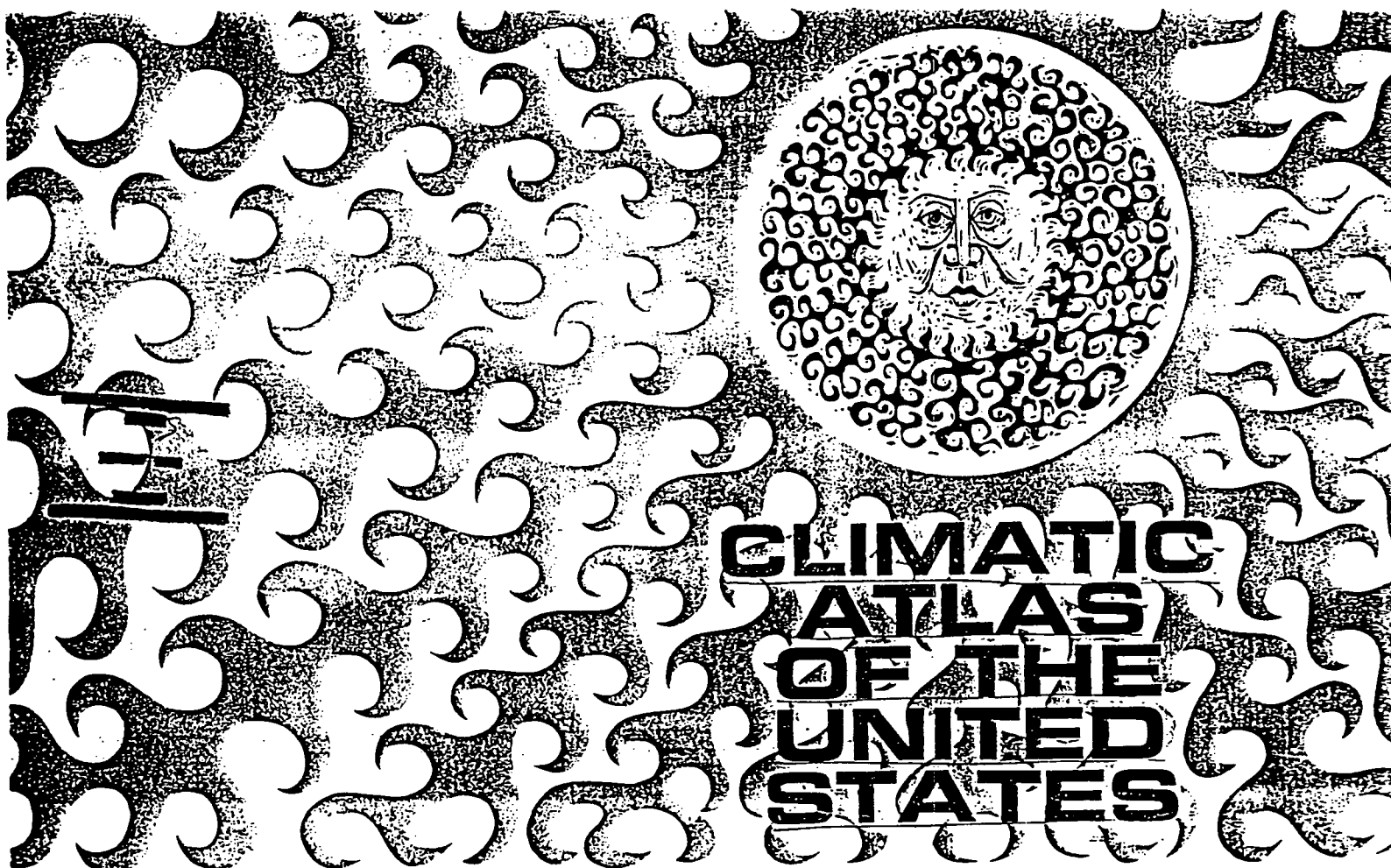
Mr. Farquhar said that they do not survey Lake Ray Hubbard. Therefore, he could not tell me what the fishing pressure was at Lake Ray Hubbard. Mr. Farquhar did note that there was full year data available for Lake Lewisville. I asked Mr. Farquhar to provide the data for Lake Lewisville. He said that the 1991 year fishing pressure for Lake Lewisville was 43 hours/hectare and the fish caught was 0.25 kg/hr. Mr. Farquhar noted that there could be significant error in using this data for other fisheries.

September 7, 1993

Mr. Farquhar noted that to his knowledge there was no fishing productivity data available for rivers or streams in this region of Texas. He did note however, that they on occasion have killed fish electronically in the Trinity river for epidemiological studies.

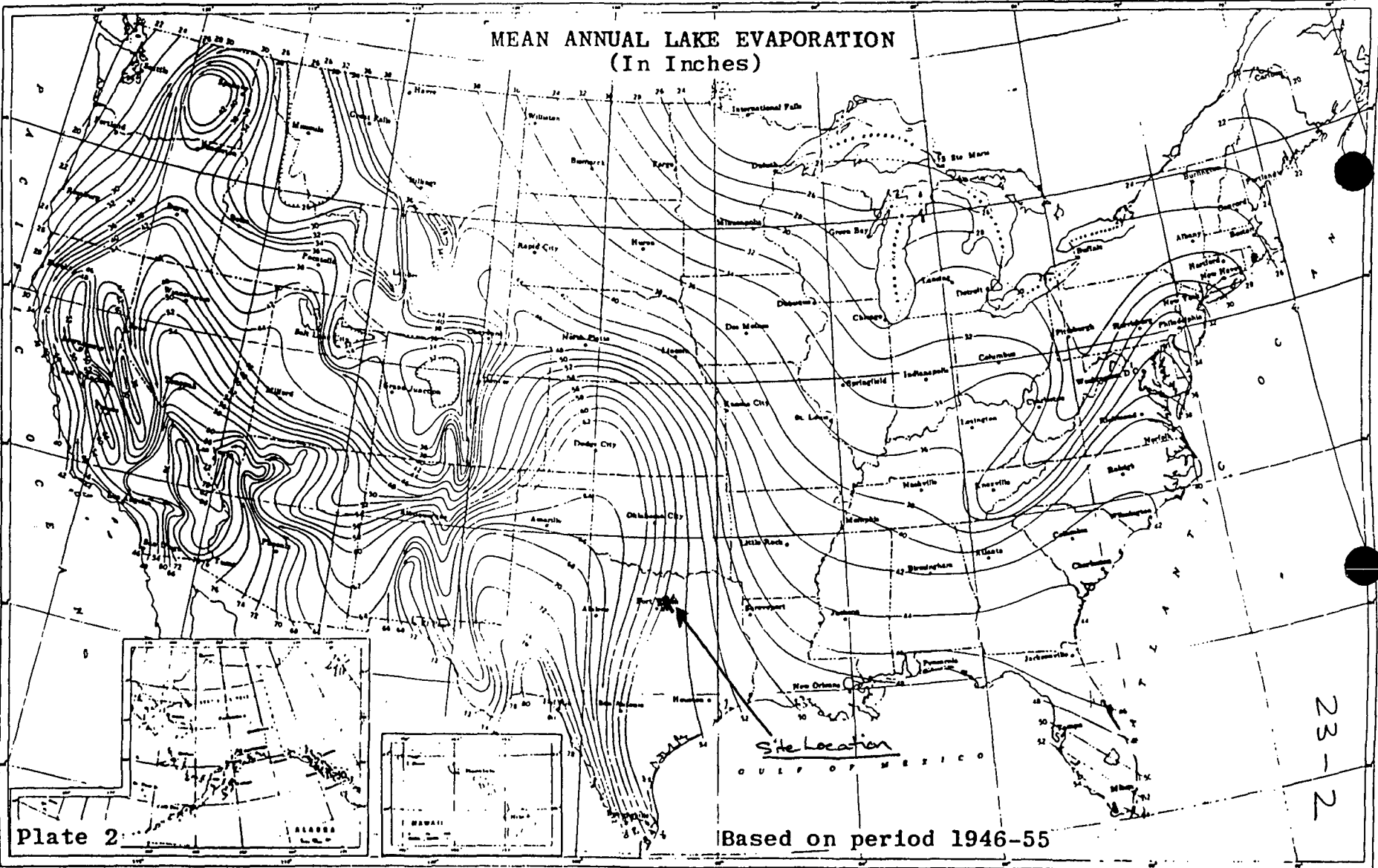
Reference 23

**Climatic Atlas of the United States,
U.S. Department of Commerce,
Environmental Science Services Administration,
Environmental Data Services, June 1968.**



U.S. DEPARTMENT OF COMMERCE • Environmental Science Services Administration • Environmental Data Service

AND LAKE EVAPORATION



Reference 24

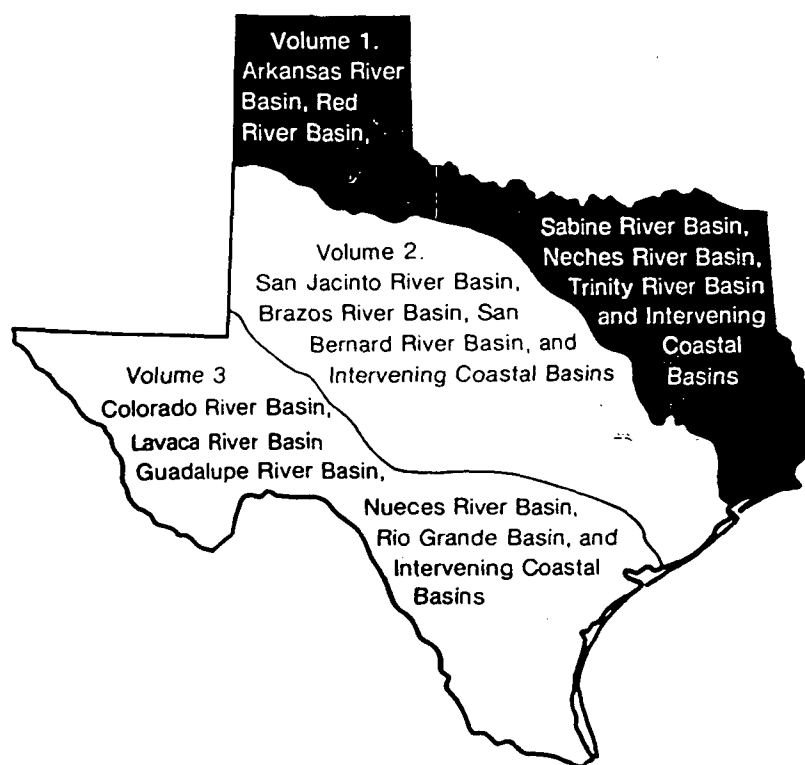
**Water Resources Data, Texas, Water Year 1991, Volume 1.
Arkansas River Basin, Red River Basin, Sabine River Basin,
Neches River Basin, Trinity River Basin, and Intervening
Coastal Basins, H.D. Buckner and W.J. Shelby, U.S.
Geological Survey Water-Data Report TX-91-1, 1991**



Water Resources Data Texas Water Year 1991

Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin, and Intervening Coastal Basins

by H.D. Buckner and W.J. Shelby



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-91-1
Prepared in cooperation with the State of Texas
and with other agencies

08061540 ROWLETT CREEK NEAR SACHSE, TX

LOCATION.--Lat 32°57'35", long 96°36'51", Dallas County, Hydrologic Unit 12030106, on left bank at downstream side of bridge on State Highway 78, 150 ft downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 250 ft downstream from Spring Creek, and 1.5 mi southwest of Sachse.

DRAINAGE AREA.--120 mi².

PERIOD OF RECORD.--March 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 450.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are fair. There are no known diversions above station. The North Texas Municipal Water District returns sewage effluent into a tributary above this station. Several observations of water temperature were made during the year. Rain gage and gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years (water years 1969-91), 106 ft³/s (76,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft³/s May 17, 1989 (gage height, 29.62 ft); no flow Aug. 24 to Sept. 2, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1942, 35.4 ft in 1942, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 12	0600	*16,300	*27.09	May 24	2200	4,540	21.86
Apr. 13	1500	6,990	24.57				

Minimum daily discharge, 13 ft³/s Oct. 7 and Aug. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	17	36	42	78	177	67	83	e77	54	22	219
2	20	19	146	40	75	98	65	81	e287	52	21	627
3	222	19	79	38	75	84	65	e1030	e726	137	20	136
4	34	376	44	37	270	82	63	e347	e103	67	18	61
5	17	48	40	50	259	81	62	e245	e370	55	18	53
6	15	28	39	224	161	77	63	142	e146	51	18	46
7	13	23	35	86	127	e72	64	120	738	49	17	112
8	20	824	33	64	114	71	64	505	274	46	16	110
9	771	334	33	183	107	68	61	186	121	43	64	52
10	45	83	33	543	103	68	57	152	102	41	35	45
11	30	57	32	123	97	69	114	136	98	40	23	41
12	26	49	31	94	92	70	3810	123	90	41	73	38
13	24	44	31	86	92	75	2470	114	80	37	83	37
14	22	40	30	130	85	80	469	838	76	38	51	38
15	20	37	29	593	79	92	221	518	69	38	33	69
16	21	37	43	151	80	87	175	144	82	46	28	52
17	19	35	45	114	81	110	297	110	77	37	23	42
18	23	35	86	241	85	84	290	98	68	35	25	44
19	19	37	42	440	75	77	156	124	65	34	23	284
20	18	35	35	164	71	78	136	86	63	32	19	58
21	25	133	117	128	72	78	130	83	62	32	18	44
22	26	303	e45	114	697	160	131	90	64	32	203	42
23	21	73	33	105	152	81	115	77	1540	32	44	44
24	19	46	32	104	121	74	107	703	111	31	22	305
25	18	40	31	101	106	74	135	1420	77	31	16	82
26	18	50	35	94	96	72	103	e171	71	30	19	50
27	18	188	50	90	92	242	157	e128	67	77	21	42
28	19	67	41	86	89	92	181	e109	62	264	14	38
29	20	43	108	84	---	76	167	e97	60	39	13	37
30	20	32	52	92	---	72	94	e87	66	26	418	37
31	19	---	44	87	---	68	---	e75	---	23	49	---
TOTAL	1624	3152	1510	4528	3631	2789	10089	8222	5892	1590	1467	2885
MEAN	52.4	105	48.7	146	130	90.0	336	265	196	51.3	47.3	96.2
MAX	771	824	146	593	697	242	3810	1420	1540	264	418	627
MIN	13	17	29	37	71	68	57	75	60	23	13	37
AC-FT	3220	6250	3000	8980	7200	5530	20010	16310	11690	3150	2910	5720
CAL YR 1990	TOTAL	72341	MEAN	198	MAX	5870	MIN	13	AC-FT	143500		
WTR YR 1991	TOTAL	47379	MEAN	130	MAX	3810	MIN	13	AC-FT	93980		

e Estimated

LOCATION.--Lat 32°46'27", long 96°30'12", Kaufman County, Hydrologic Unit 12030106, on right bank 25 ft downstream from bridge on Interstate Highway 20, 0.2 mi downstream from Duck Creek, 1.9 mi downstream from Lake Ray Hubbard Dam, 2.5 mi upstream from Texas and Pacific Railroad Co. bridge, 2.6 mi northwest of Forney, and 30.8 mi upstream from mouth.

DRAINAGE AREA.--1,118 mi², of which 1,071 mi² is above Lake Ray Hubbard.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1973 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 374.86 ft above National Geodetic Vertical Datum of 1929 (from State Department of Highways and Public Transportation bridge plans). Prior to Aug. 26, 1975, recording gage at 3-foot higher datum located at site 126 ft upstream and 868 ft to left. From Aug. 26, 1975, to May 12, 1977, recording gage at 3-foot higher datum located at site 105 ft downstream. From May 13, 1977, to Sept. 30, 1984, recording gage at 3-foot higher datum at current site.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow is regulated by Lake Ray Hubbard (station 08061550) 1.9 mi upstream. Low flow is sustained by sewage effluent discharge from the city of Garland into Duck Creek, which enters the East Fork Trinity River 0.2 mi upstream from this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--18 years (water years 1974-91), 600 ft³/s (434,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,000 ft³/s May 3, 1990 (gage height, 22.01 ft), from rating extended above 52,300 ft³/s; minimum daily, 13 ft³/s Oct. 18, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38,200 ft³/s (calculated from Lake Ray Hubbard release data and incremental discharge values for Duck Creek near Garland, station 08061700) Apr. 13 at about 1300 hours (gage height, about 20.3 ft, from rating table value nearest the calculated peak discharge); minimum daily, 23 ft³/s July 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	28	45	54	60	288	33	976	248	31	34	122
2	35	25	69	52	56	522	31	971	83	32	32	249
3	51	25	175	48	53	290	34	2250	1580	32	33	119
4	90	126	65	49	127	49	33	2150	478	65	33	58
5	39	149	52	46	414	43	33	2430	357	40	31	43
6	35	38	50	171	637	41	32	2190	1220	33	30	37
7	33	36	46	205	586	46	33	2210	1250	25	30	40
8	33	213	43	90	342	56	33	2390	1770	26	29	104
9	298	688	43	80	82	39	34	2290	1290	33	31	52
10	79	110	43	605	68	35	30	2220	896	34	65	47
11	39	64	43	204	63	37	32	2200	891	33	45	36
12	32	51	41	102	56	31	e12900	1570	892	29	57	34
13	31	42	41	88	46	38	e23400	382	536	27	177	35
14	31	39	39	84	47	35	e8910	178	45	25	184	33
15	37	36	40	315	56	30	e28	1820	37	26	88	55
16	37	33	40	153	56	40	e435	1840	39	26	53	48
17	36	32	45	97	54	43	e1870	1090	70	26	45	43
18	32	31	67	167	50	45	e2150	543	39	27	41	42
19	28	31	67	411	59	32	e2210	692	35	27	34	250
20	27	33	45	156	176	29	e2200	837	35	26	34	121
21	30	32	46	104	541	29	e2210	90	35	25	263	55
22	36	369	65	92	2220	84	e2240	50	35	25	180	45
23	32	178	53	81	881	81	2200	54	2280	25	55	41
24	30	70	50	75	97	39	2010	102	1530	23	45	71
25	38	52	47	73	69	31	2040	5760	63	99	37	179
26	35	46	50	64	262	31	2020	1870	48	43	38	56
27	25	95	124	62	495	53	2030	918	42	42	90	46
28	25	133	60	69	260	323	2030	1590	35	332	46	41
29	39	57	85	74	---	55	2440	1360	31	109	36	41
30	40	46	118	78	---	36	1660	928	34	46	394	39
31	38	---	60	67	---	34	---	665	---	42	140	---
TOTAL	1427	2908	1857	4016	7913	2565	75341	44616	15924	1434	2430	2182
MEAN	46.0	96.9	59.9	130	283	82.7	2511	1439	531	46.3	78.4	72.7
MAX	298	688	175	605	2220	522	23400	5760	2280	332	394	250
MIN	25	25	39	46	46	29	28	50	31	23	29	33
AC-FT	2830	5770	3680	7970	15700	5090	149400	88500	31590	2840	4820	4330
CAL YR 1990	TOTAL	509569	MEAN	1396	MAX	50700	MIN	25	AC-FT	1011000		
WTR YR 1991	TOTAL	162613	MEAN	446	MAX	23400	MIN	23	AC-FT	322500		

e Estimated

08061700 DUCK CREEK NEAR GARLAND, TX

LOCATION.--Lat 32°49'58", long 96°35'43", Dallas County, Hydrologic Unit 12030106, on right bank in the median area between the dual bridges on Belt Line Road, 6.0 mi southeast of Garland, and 7.7 mi upstream from mouth.

DRAINAGE AREA.--31.6 mi².

PERIOD OF RECORD.--January 1958 to current year.

Water-quality records.--Chemical analyses: January 1969 to September 1982. Chemical and biochemical analyses: July 1988 to September 1989. Sediment analyses: January 1979.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 430.02 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1962, at datum 4.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow is slightly regulated by several small on-channel dams. There are several small diversions above station including the irrigation of a golf course. Low flows are sustained by effluents from the city of Garland. Record rain gage located at station.

AVERAGE DISCHARGE.--33 years, 33.1 ft³/s (14.22 in/yr), 23,980 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft³/s Apr. 16, 1990 (gage height, 21.06 ft, present datum); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1895, 21.5 ft (present datum) June 13, 1949, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Apr. 12	0145	*15,700	*20.77	May 24	2400	3,610	17.34
Apr. 13	1245	14,200	20.39	June 23	0345	6,220	18.21

Minimum daily discharge, 1.0 ft³/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.4	5.1	5.6	5.8	56	6.6	10	7.5	5.3	3.4	132
2	1.2	1.4	91	5.4	5.3	13	6.7	9.5	63	4.1	3.1	59
3	65	1.4	19	6.0	5.0	10	7.6	195	184	18	3.2	14
4	8.1	e147	7.7	5.0	195	9.2	7.2	81	13	13	3.1	7.2
5	2.6	e16	6.2	8.0	167	8.8	7.4	43	92	5.6	3.0	5.5
6	1.9	e4.7	5.8	170	24	8.3	7.3	11	33	4.9	2.4	4.2
7	1.4	e2.3	5.2	25	12	7.6	9.4	9.6	93	3.5	2.3	31
8	3.0	e291	4.3	10	10	7.3	7.3	141	35	3.1	2.2	24
9	351	e126	4.2	166	8.4	7.3	7.4	22	11	2.4	21	5.4
10	6.5	e29	4.2	422	7.5	6.7	6.5	12	9.4	2.4	12	3.6
11	3.9	e13	3.6	25	6.9	7.1	71	10	9.2	3.2	5.8	3.1
12	2.9	e6.7	3.9	11	6.4	7.1	2770	9.2	7.9	2.6	76	2.7
13	2.5	e4.0	4.0	8.7	6.2	7.6	2300	8.1	6.8	2.3	102	2.7
14	2.4	2.9	4.1	84	6.1	8.5	99	121	6.0	2.2	58	4.7
15	2.1	2.8	3.8	81	5.4	12	39	107	7.8	2.0	13	15
16	2.0	2.9	4.6	13	5.3	12	21	14	29	2.2	7.9	4.5
17	1.9	2.7	8.9	10	5.4	21	224	10	12	2.7	5.6	3.9
18	1.9	2.4	34	155	9.4	9.1	190	9.6	7.2	2.7	4.4	10
19	1.9	2.3	6.5	134	5.9	7.2	78	30	6.0	2.3	3.6	169
20	1.6	2.5	4.1	16	4.9	7.4	21	16	5.3	2.1	2.5	8.3
21	5.9	75	10	11	5.1	7.6	16	8.3	5.3	1.9	4.1	4.3
22	6.1	231	4.5	9.2	275	102	15	8.0	5.6	1.8	228	3.6
23	2.9	18	3.0	8.7	19	14	14	10	897	1.6	15	3.1
24	3.7	8.9	2.8	9.7	14	10	13	337	13	42	6.3	91
25	2.3	7.0	4.0	7.7	11	10	25	408	8.8	20	4.6	12
26	1.8	15	43	6.7	9.9	9.8	12	19	7.8	10	36	4.1
27	1.6	91	34	6.2	9.3	70	30	12	7.1	77	13	3.3
28	1.6	14	7.0	5.6	9.3	13	47	9.3	5.7	206	4.8	2.5
29	1.6	7.0	67	5.7	---	9.3	27	7.7	4.5	11	4.3	2.2
30	1.7	5.7	11	7.8	---	8.4	11	7.5	9.2	6.1	378	2.2
31	1.5	---	5.3	8.7	---	7.1	---	6.3	---	4.1	18	---
TOTAL	495.5	1135.0	421.8	1447.7	854.5	494.4	6096.4	1702.1	1602.1	468.1	1046.6	638.1
MEAN	16.0	37.8	13.6	46.7	30.5	15.9	203	54.9	53.4	15.1	33.8	21.3
MAX	351	291	91	422	275	102	2770	408	897	206	378	169
MIN	1.0	1.4	2.8	5.0	4.9	6.7	6.5	6.3	4.5	1.6	2.2	2.2
AC-FT	983	2250	837	2870	1690	981	12090	3380	3180	928	2080	1270
CFSM	.51	1.20	.43	1.48	.97	.50	6.43	1.74	1.69	.48	1.07	.67
IN.	.58	1.34	.50	1.70	1.01	.58	7.18	2.00	1.89	.55	1.23	.75

CAL YR 1990	TOTAL	23121.4	MEAN	63.3	MAX	2680	MIN	1.0	AC-FT	45860	CFSM	2.00	IN.	27.22
WTR YR 1991	TOTAL	16402.3	MEAN	44.9	MAX	2770	MIN	1.0	AC-FT	32530	CFSM	1.42	IN.	19.31

e Estimated

Reference 25

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Ken Smith, Landfill Director, City of Garland
Sanitation Department, August 31, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD

DATE: August 31, 1993

LOCATION: Irvine, CA

TIME: 10:50 a.m. PST

TO: Ken Smith, Landfill
Director City of Garland Sanitation
Department (214) 205-2713

P.O. NO. 635336-41

OTHER REF. City of Garland Landfill SIs

LOCATION: Garland, TX

Mr. Smith answered the following questions in regards to the City of Garland Landfills:

- 1) What is the depth of the waste at the landfills?

Miles Road Landfill	- 10-15 feet from grade
Miller Road Landfill	- 10-15 feet from grade
E. Garland Road Landfill	- 10-15 feet from grade
Miller Road Landfill	- 10-15 feet from grade
Castle Drive Landfill	- 15-20 feet from grade
Castle Drive & Miles Road Landfill	- 15-20 feet from grade

- 2) What is the estimated quantity of waste for the Castle Drive and Castle Drive & Miles Road Landfill?

From the 1992 annual operating report submitted to the State of Texas the total landfill complex estimated waste quantity is 8,231,399 cubic yards. The proportion that has been disposed at each site is not available.

- 3) What is the acreage of the area used as landfill at the operating landfill complex?

The operating landfill complex is 191 acres of which 30 acres will not be used as landfill.

Reference 26

**Record of Telephone Conversations between Tom
Casabonne, Fluor Daniel, and the Dallas County Tax Office
(various personnel), March 22-30, 1993.**

RECORD OF TELEPHONE CONVERSATION

FROM: Tom Casabonne *TJC*

DATE: March 22-30, '93

LOCATION: Irvine, 552M

TIME:

TO: Dallas County Tax Office

P.O. NO.:

LOCATION: (214) 653-7811 (3) (1)

OTHER REF. Legal descriptions and owners

Before calling the Dallas County Tax Office, I first obtained tax account numbers for the various plots by calling the tax office of the Garland Independent School District at (214) 494-8570. Lisa Freeman looked up the sites on the plats in that office and faxed me the maps that we needed along with tax account numbers for each plot. She also sent me the most current owner information that she had. I verified and corrected that data by calling the Dallas County Tax Office and getting the information over the telephone. That information is shown below:

Miles Rd.

Tax Account No. (b) (6) located at 23 Miles Rd.
Legal Description: Abst 225, pg 580, Tr 23 [29.71 ac]
Owner: Joel Vaughn McCallum (9214 Miles Rd., Rowlett, TX 75088)

[Castle & Miles]

Tax Account No. 65022558010210000
Legal Description: Abst 225, pg 580, Tr 21 [59.92 ac]
Owner: City of Garland

Castle Drive

Tax Account No. 65022558010170000
Legal Description: Abst 225, pg 580, Tr 17 [127.50 ac]
Owner: City of Garland

Tax Account No. 65022558010150000
Legal Description: Abst 225, pg 580, Tr 15 [19.82 ac]
Owner: City of Garland

Tax Account No. 65022558010160000
Legal Description: Abst 225, pg 580, Tr 16 [2.0 ac]
Owner: City of Garland

The following parcels are small, adjacent plots which all belong to the City of Garland. The legal descriptions were not verified with the Dallas County Tax Office.

Tax Account No. 6502255800040000
Legal Description: Abst 225, Tr 14

Tax Account No. 65022558010410000
Legal Description: Abst 225, Tr 41

Tax Account No. 65022558010400000
Legal Description: Abst 225, Tr 40

Tax Account No. 65022558010360000
Legal Description: Abst 225, Tr 36

Tax Account No. 65022558010370000
Legal Description: Abst 225, Tr 37

Tax Account No. 65022558010380000
Legal Description: Abst 225, Tr 38

Tax Account No. 65022558010390000
Legal Description: Abst 225, Tr 39

Tax Account No. 65022558010470000
Legal Description: Abst 225, Tr 47

Tax Account No. 65022558010420000
Legal Description: Abst 225, Tr 42

Tax Account No. 65022558010430000
Legal Description: Abst 225, Tr 43

Tax Account No. 650225580010440000
Legal Description: Abst 225, Tr 44

Tax Account No. 65022558010460000
Legal Description: Abst 225, Tr 46

Tax Account No. 65022558010450000
Legal Description: Abst 225, Tr 45

East Garland Rd.

Tax Account No. (b) (6) located at 2826 Centerville Rd.

Legal Description: Abst 952, Tr 6 [11.461 ac]

Owner: Maderia Corp., Paul Penkova (b) (6) The tax office said that this property is involved in multi-suit no. 30087, with a total of \$12,607.15 owed in back taxes for the years '90, '91, and '92. For more information call the master court at (214) 653-6010.

Tax Account No. 65095209110050000, located at 1100 Commerce.

Legal Description: Abst 0952, pg 091 [20.0 ac]

Owner: City of Dallas (1500 Marilla, Dallas, TX 75201)

Quail Creek

26-3

Tax Account No. (b) (6) located at 1100 State Hwy 66.
Legal Description: Abst 952, pg 090, Tr 11.5 [8.319 ac]
Owner: Millcreek Associates Limited Partnership (b) (6)

Tax Account No. (b) (6) located at 1520 Commerce.
Legal Description: Abst 952, pg 90, Tr 1 [49.9816 ac]
Owner: Cambridge Consolidated (b) (6) The county Law Office is suing the owner to recover \$19,806.82 in back taxes, which are owed from 1988-92. For more information, call the master court at (214) 653-6010 and ask about case no. 93-30070TA.

East Miller Rd.

Tax Account No. (b) (6)
Legal Description: Abst 761, pg 363, Tr 37 [13.016 ac]
Owner: Oleta Mae Cannaday (b) (6)

Tax Account No. (b) (6)
Legal Description: Abst 761, pg 363, Tr 38 [1.0 ac]
Owner: F. T. Drum (b) (6)

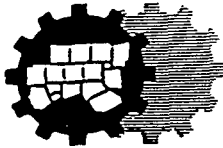
Tax Account No. (b) (6)
Legal Description: Abst 1681, pg 380, Tr 1 [5.49 ac]
Owner: F. T. Drum (b) (6)

Tax Account No. (b) (6)
Legal Description: Abst 982, pg 250, Tr 1 [3.56 ac]
Owner: F. T. Drum (b) (6)

26,3

Reference 27

**"WELL LOCATIONS NEAR THE CASTLE DRIVE AND MILES
ROAD LANDFILL" map, North Central Texas Council of
Governments, Department of Environmental Resources,
July 14, 1993.**



North Central Texas Council Of Governments

27-1

July 16, 1993

Jonathan Stewart
Fluor Daniel
12790 Merit Drive, Suite 200
Dallas, Texas 75252

Dear Mr. Stewart:

I am providing the Geographic Information System maps which you requested several weeks ago. The original request was for GIS plots of the areas surrounding 6 landfill sites, the available information on area water wells within a 4-mile radius. Information was also requested on surface water intake locations.

As I indicated during our phone conversation, NCTCOG's well coverage is adapted from Texas Water Development Board data, and NOT a complete database. Most of the wells are more significant public supply wells. The following wells are within the area of interest:

3303601	City of Garland - Plugged
3303901	City of Garland - Plugged
3303902	City of Garland - Plugged
3303903	City of Garland - Plugged
3303904	City of Garland - Plugged
3303905	City of Garland - Plugged
3303801	City of Garland - Plugged
3304101	Owner unknown Woodbine Depth=1388 ft
3304801	City of Rowlett Paluxy Depth = 2658 ft

All of the Garland wells are shown as plugged. The status of the other two wells is unknown, and there is no information on how many people are served. It is likely that the well with the unknown owner is some sort of private well. The Rowlett well can be check with city staff to determine its status.

To our knowledge there is only surface water intake on Lake Ray Hubbard near Forney Dam. Dallas withdraws water for treatment at the Dallas Eastside Water Treatment Plant and it passes into the Dallas distribution system. Dallas is authorized to divert 80.1 MGD, with 54.1 MGD considered a dependable yield. The entire Dallas system serves 1.7 million customers, with the water from Lake Ray Hubbard blended with other sources during distribution. You might calculate a rough estimate by dividing the volume withdrawn by a gallons per capita per day figure, but it would be difficult to determine the number of persons served.

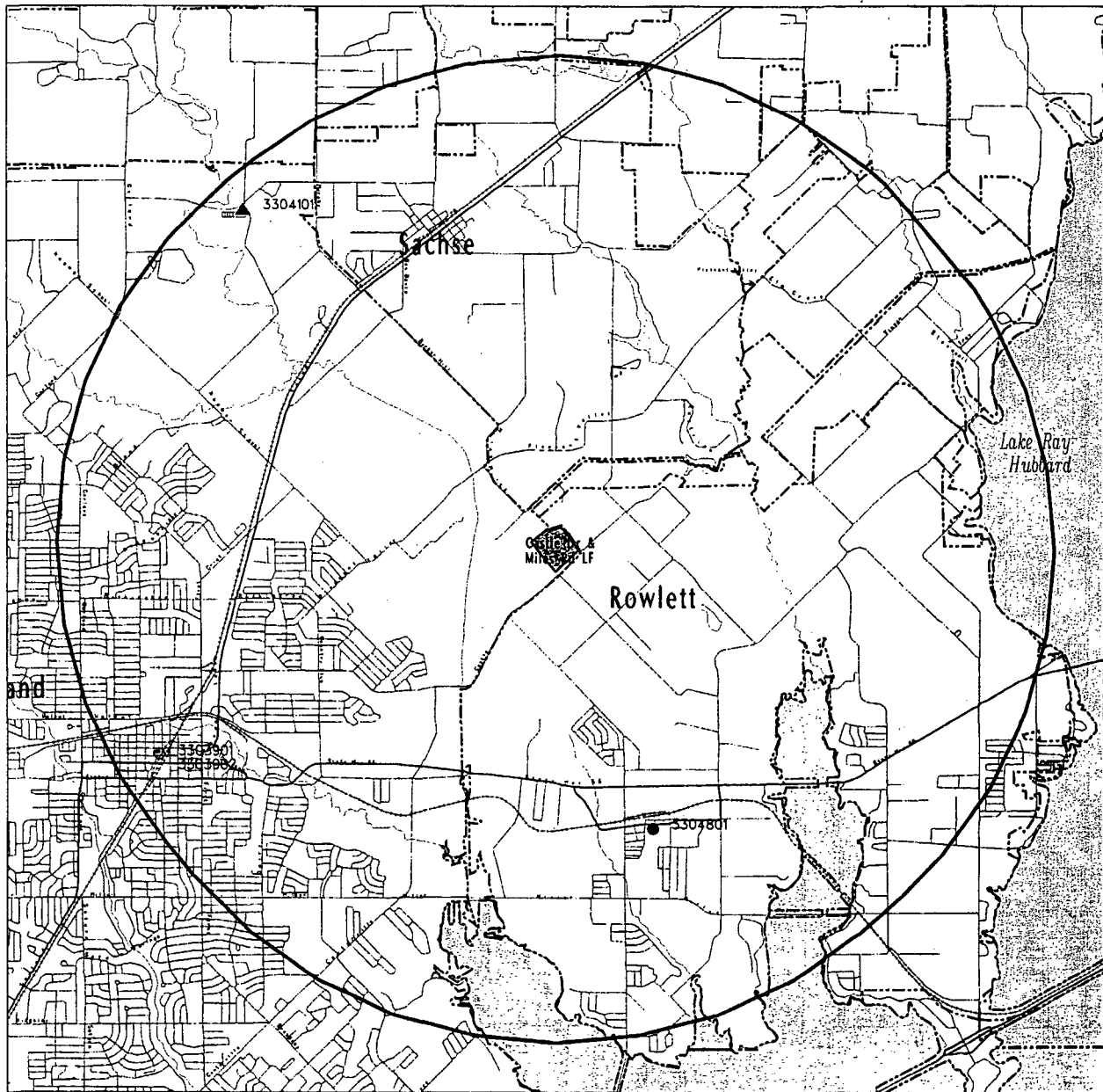
I hope that this information proves useful. Please contact me if there are any questions.

Sincerely,

Samuel W. Brush

27,1

WELL LOCATIONS NEAR THE CASTLE DRIVE AND MILES ROAD LANDFILL



/ City Boundaries
 / Primary Roads
 / Other Roads
 / Streams/Shorelines
 / Railways
 / Four Mile Buffer Boundary

Public Supply Wells

- Active
- Inactive
- Plugged
- Abandoned
- Status Under Review

Other Wells

- ▲ Active
- ▲ Inactive
- ▲ Plugged
- ▲ Abandoned
- ▲ Status Under Review



North Central Texas Council of Governments



Department of Environmental Resources

021/163

Base Map: 1:50,000 1984 D-2 Data File: Texas State Plane Coordinate System, North Central Zone
 City Boundaries: Texas State Plane Coordinate System, North Central Zone
 Well Locations: Texas Water Development Board

Reference 28

**Record of Telephone Conversation between Josh Sacker,
Fluor Daniel, and Jack May, City of Garland Water
Department, April 8, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: Josh Sacker *water* DATE: 4/8/93
LOCATION: Environmental Services TIME: _____
TO: Project Files - ARCS P.O. NO. _____
LOCATION: _____ OTHER REF. ARCS Hazardous Ranking System

Conversation with Jack May, Chief of City of Garland Water Department (214) 205-3200.

There are no municipal wells in Garland. It is all surface water for city distribution. Surface water source for Garland is Lake Levon, approximately 25 miles northeast of the city. The water is carried by pipeline. Lake Levon is a U.S. Army Corps of Engineer reservoir. Garland used a number of wells (about five) prior to 1960 for water supply, however, these were ineffective due to depth (approximately 3,200 below ground surface) and high water temperatures. They were abandoned in accordance with Texas State law and filled with sand and concrete. They were located in Central Garland (near the intersections of Main and Commerce streets), some were located farther to the northwest). He said there may be some shallow water locally, but yields are not adequate for municipal purposes. The city does not have information on the location of private wells. Treated waste water was previously discharged to Lake Ray Hubbard. This treatment plant is owned by the City of Garland and serves the cities of Rowlett, Garland, and Sachse. The treatment effluent has been re-routed into another basin and is no longer discharged to Lake Ray Hubbard.

Reference 29

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Junior Garza, City of Rowlett Public
Utilities, August 24, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters (FD) *WW* DATE: August 24, 1993
LOCATION: Irvine, CA TIME: 7:45 a.m. PST
TO: Junior Garza, City of Rowlett, P.O. NO. 06635336-41
Public Utilities (214) 475-1314
OTHER REF. City of Garland Landfill
LOCATION: Rowlett, TX Site Investigations

discussed the public supply well shown to be in the City of Rowlett by the North Central Texas Council of Government's well location maps produced for the City of Garland Landfill Sites. Mr. Garza noted that the pumping and distribution equipment for this artesian well had been removed and the well capped some years ago. Mr. Garza indicated that the City of Rowlett was exclusively using water supplied from Lake Leon.

Reference 30

**Miles Road Landfill Field Notebook, William Walters,
Fluor Daniel, July 12, 1993.**

8

(notes this is transcribed from records kept on-site during sampling - field notebook was not brought on-site)

Sampling 7/12/93

Drinking water samples

①

First Sampling location

(b) (6)

(b) (6)

use ground water for cleaning & toilet but not drinking.

Sample location is at of tap from the side of the house.

Tap was purged for 5 minutes prior to sampling
sampling began at 10:55. QALQC & duplicate samples taken & trip blank performed at this site.

Water characteristics:

ph:

Cond:

Temp:

②

Second sampling location

(b) (6)

(b) (6)

well is inactive. Total well volume is approximately 750 gallons. depth to water 14 feet depth of well 34.5 feet & diameter of well (circular) 30 inches (50).

Since it would take 7 1/2 hours to triple volume
purge a purge at about 1 hour will be performed.
purge by cleaned submersible pump

30.1

Sample 7/12/93 (continued)

purge started 15:15

purge rate at start = 4.3 gpm (5 gallons / 1 min 16 sec)

pH = 7.55

Cond = 640 μ S/cm

Temp = 73

purge rate @ 20 min = 4.3 gpm

pH = 7.55

Cond = 650 μ S/cm

Temp = 75°F

purge rate @ 45 min = 4.3 gpm

pH = 7.60

Cond = 660 μ S/cm

Temp = 75°F

purge finished at 16:20

Total purge volume \approx 280 gallons

purged liquids used on garden at site as per Jo Harris.

pH & cond considered stable during the purge
water level after purge = 20.3 feet (Δ 231.32 gallons) which is reasonable considering the volume of the purge > 231.32 gallons.

Sample taken ^{using} new cleaned bailer @ 16:30.

Reference 31

**Geologic Atlas of Texas, Dallas Sheet, Bureau of Economic
Geology, the University of Texas at Austin, 1972.**

31-1



PROPERTY
OF
U.S. GOVERNMENT

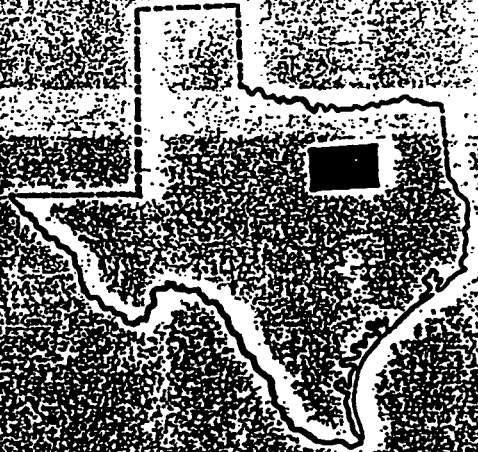
BUREAU OF ECONOMIC GEOLOGY
THE UNIVERSITY OF TEXAS AT AUSTIN
AUSTIN, TEXAS 78713-7508

W. L. FISHER, *Director*

GEOLOGIC ATLAS OF TEXAS

Dallas Sheet

Scale: 1:250,000



1972

31,1

Upper Cretaceous

Ko

Ozan Formation ("lower Taylor marl")

Clay, calcareous, silt and sand content increases upward, montmorillonitic, blocky, conchoidal fracture, medium gray; some glauconite, phosphate pellets, hematite nodules, and pyrite nodules; some very thin limestone lenses locally in lower part; weathers light brownish gray with poor fissility, grades upward to Wolfe City Formation; marine megafossils; thickness 500± feet

Kau

Austin Chalk

Upper and lower parts, chalk, mostly microgranular calcite, massive, some interbeds and partings of calcareous clay, thin bentonitic beds locally in lower part, lower part forms westward-facing scarp; light gray. Middle part, mostly thin-bedded marl with interbeds of massive chalk, locally burrowed, marcasite-pyrite nodules common, light gray. Weathers white, marine megafossils scarce, thickness 300-500 feet, thins southward

Kef

Eagle Ford Group undivided

North of Hill County, shale, sandstone, and limestone; shale, bituminous, selenitic, with calcareous concretions and large septaria; sandstone and sandy limestone in upper and middle parts, platy, burrowed, medium to dark gray; in lower part bentonitic; hard limestone bed marks base in Ellis and Johnson Counties; locally forms low cuesta; thickness 200-300 feet

Kwb

Woodbine Formation

Sandstone, some clay and shale. Upper part, mostly sandstone, fine grained, well sorted, in part tuffaceous, ripple marked, large scale cross-bedding, reddish brown; near top some sandstone with large discoid concretions, medium to coarse grained, friable; some shale, jarositic, gray, fissile; some marine megafossils, oyster reefs locally. Middle part, mostly sandstone, fine grained, cross-bedded; some interbeds of clay, carbonaceous, in part sandy, gray to brown. Lower part, interbedded sandstone and clay; sandstone, fine grained, very thinly bedded to massive, some beds of ironstone and ironstone conglomerate, white, red, brown; clay, sandy, gray to brown; channeled locally. Thickness 175-250 feet, thickens northward

Kgm

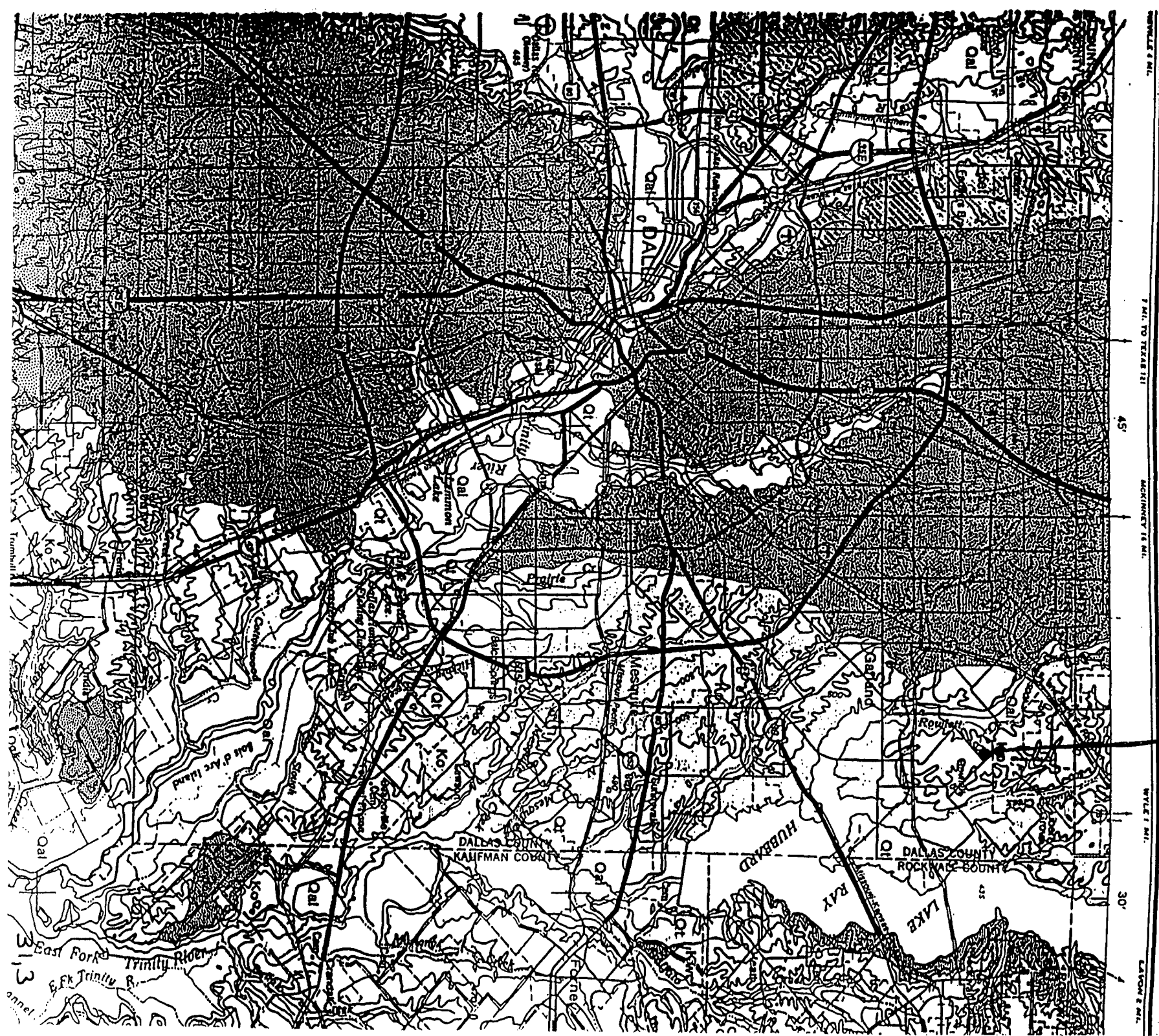
Grayson Marl and Main Street Limestone undivided

Mostly Grayson Marl, mostly calcareous clay and marl, blocky, yellowish gray and medium gray; some 0.25-1.0-foot limestone beds in upper one-third, very fine grained, fossiliferous; weathers yellowish brown, forms gentle slope; thickness 60-100 feet, thins northward
Main Street Limestone, medium grained, chalky, some 6-8-foot units of calcareous shale, thin bedded to massive, distinctly bedded to wavy bedded and nodular, yellowish gray; weathers light gray to white; thickness 20-35 feet, thins northward

Lower Cretaceous

CRETACEOUS

Castle miles landfill
Site location



Reference 32

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and David Terry, Texas Water Commission,
October 5, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD

DATE: October 5, 1993

LOCATION: Irvine, CA

TIME: 2:00 p.m. PST

TO: David Terry, Texas Water
Commission (512) 475-4610

P.O. NO. 635336-41

LOCATION: Austin, TX

OTHER REF. City of Garland Landfill SIs

Mr. Terry indicated that there were no Wellhead Protection Areas in eastern Dallas County or in any part of Collin County. Mr. Terry indicated that the Wellhead Protection Areas in Dallas County were exclusively in western Dallas County (i.e. Grand Prairie and Irving).

Reference 33

**Record of Telephone Conversation between Tom Casabonne,
Fluor Daniel, and Ken Smith, Landfill Director City of Garland
Sanitation Department, March 16, 1993.**

FLUOR DANIEL

RECORD OF TELEPHONE CONVERSATION -

FROM: Tom Casabonne TFC DATE: 3-16-93
LOCATION: Irvine, 552M TIME: 14:25
TO: Ken Smith (214) 205-2713 P.O. NO. _____
LOCATION: Landfill Director, City of Garland OTHER REF. _____

Mr. Smith gave me the following information on Garland landfills:

Miles Rd. - Owned by Vaughn McCallum (9214 Miles Rd., Rowlett, TX). The site is closed. It has a clay liner on the bottom and 3 ft. final cover on the surface, with no other controls. No sampling has been conducted and there have been no releases. It was last checked in November '92 (the city sanitation dept. checks the sites every 6 months). It is currently being used to graze sheep.

[Castle Drive/Castle Miles - Operating under permit 1062A, issued 8-26-87. The original operating permit number for Castle Drive was 1026, issued on 9-19-77. It has a clay liner with 13 monitoring wells around the site. They check for methane around perimeter on an annual basis. Mr. Smith says that the site was enlarged by adding about 30 acres "on the inside of the L." Castle Miles operates under permit 1277, issued on 9-10-79. They plan to use this site until 1999. It is a municipal landfill, so they turn away liquids and hazardous materials.]

East Garland Rd. - Eight to ten acres, operated under permit 05/50582 from May '70 to May '73. (That differs from our EPA file, which says May '70 to April '71, but Mr. Smith said he wouldn't argue with the EPA on this point. His dates of operation were also different on the Quail Creek and East Miller Rd. sites.) It was last inspected in November '92.








Quail Creek - Approximately 20 acres, operated from May '72 to May '73. (EPA file says May '72 to March '75.) His information lists two owners: Sunbelt Federal Savings (300 E. Carpenter Freeway, Irving, TX 75016) and Cambridge Consolidated (5823 Edinburgh St., Dallas, TX 75252). It was last inspected in November '92.

East Miller Rd. - Approximately 10 acres, operated from May '71 to May '72. (EPA file says July '71 to May '72.) Owners are Oleta M. Cannaday (301 Edgefield Dr., Garland, TX 75040) and Emma Drum (600 Main St., Garland, TX 75040).

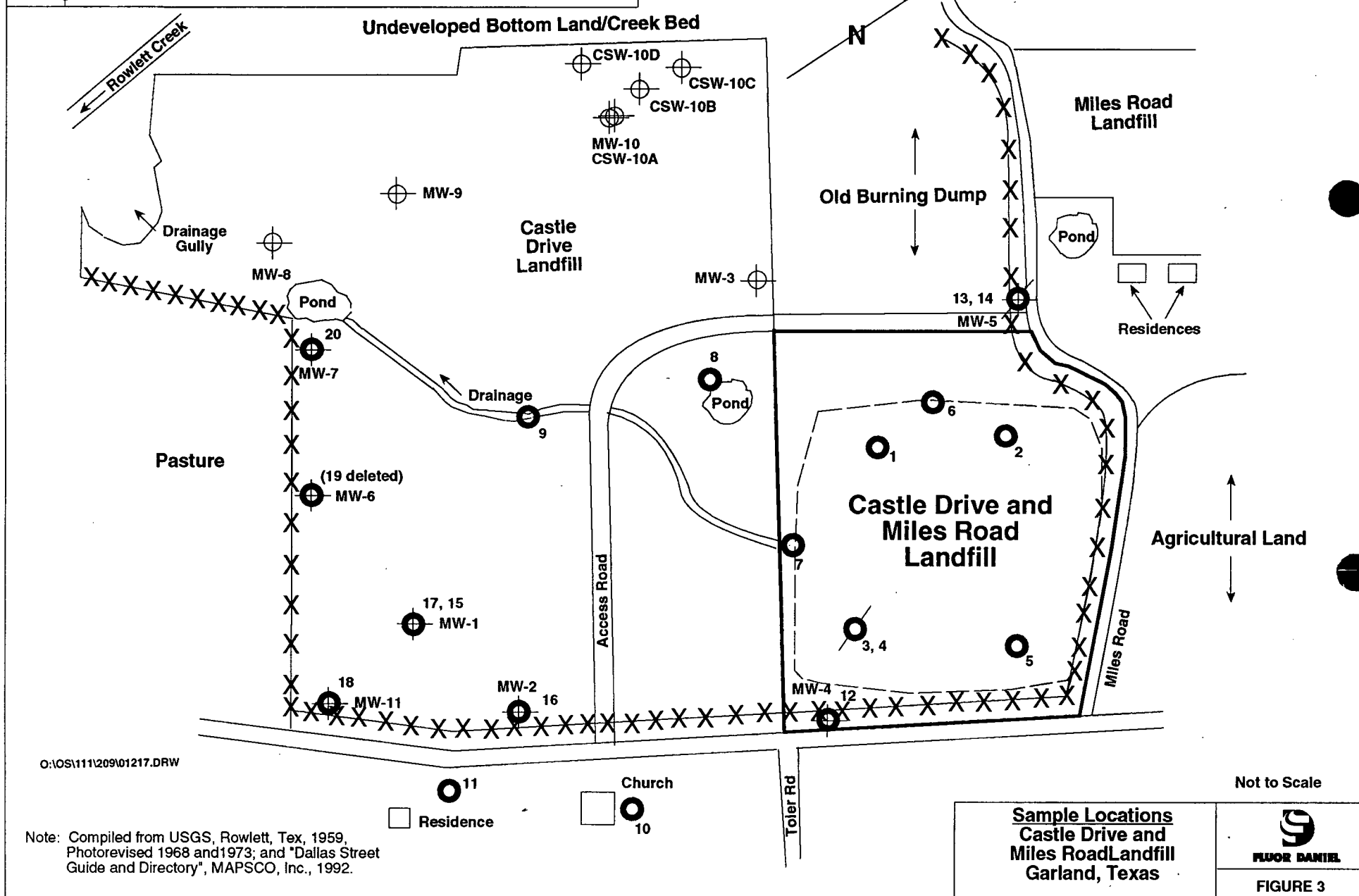
Reference 34

**Sampling Location Map, Castle Drive and Miles Road Landfill,
Fluor Daniel, September, 1993.**

LEGEND:

-  FENCE
-  ROADS
-  SITE AREA
-  MONITORING WELL
-  PROPOSED SAMPLE LOCATION
-  DUPLICATE SAMPLE
-  WASTE DISPOSAL AREA

Note: Sample 19 was not able to be collected as well did not develop.



O:\OS\111\209\01217.DRW

Note: Compiled from USGS, Rowlett, Tex, 1959, Photorevised 1968 and 1973; and "Dallas Street Guide and Directory", MAPSCO, Inc., 1992.

Sample Locations
Castle Drive and
Miles Road Landfill
Garland, Texas

Not to Scale



FIGURE 3

Reference 35

**Inorganic Soil Data Validation Package for Miller Road
Landfill, October 27, 1993.**

DATA QUALITY ASSURANCE REVIEW

Site Name: Miller Road Landfill
Site Code: TXD980750590
Case Number: 20355

Laboratory: CompuChem Laboratories, Research Triangle Park, NC

Soil Samples: MFBT19, MFBT20, MFBT21, MFBT22,
MFBT23, MFBT24, MFBT25, MFBT25D,
MFBT26, MFBT27, MFBT28, MFBT29,
MFBT30, MFBT31, MFBT32, MFBT33,
MFBT34,

The data package consists of 17 soil samples analyzed for TCL metals and cyanide. One sample was a laboratory duplicate.

1. Analytical Parameters: All samples were analyzed using multi-media, low concentration protocols.
2. Holding Times: All sample preparation and analysis were conducted within holding time limits.
3. Calibration Verification: All initial calibration verification results were within control limits.

All continuing calibration verifications were conducted at the proper frequency. All results except beryllium met quality control criteria. (see Blanks)

4. Blanks: The CCB for beryllium exceeded the IDL. All detected beryllium concentrations are flagged (B) because the analyte concentrations were < 5X CCB.

All other blanks met quality control criteria or did not affect the sample data.

5. Matrix Spike Recovery: The spike recovery for lead <30% so all lead concentrations are flagged (J). Its sample concentration >IDL. The manganese spike recovery >125%. The sample concentration >IDL. All analyte concentrations are flagged (J).

The spike recovery for selenium was miscalculated. It is listed as 57.2%. The correct value is 27.2%. The %R <30% and the IDL > sample concentration. The analyte concentration in sample MFBT22 is flagged (R).

6. Duplicates: All laboratory duplicates met quality control criteria. MFBT26 is a field duplicate of MFBT25.

All analytes meet quality control criteria.

7. Laboratory Control Samples: Quality control criteria were met in all samples.

8. ICP Interference Check Sample (ICS): ICP interference check samples were analyzed at the specified frequency and the results were within control limits.

9. ICP Serial Dilution: Quality control criteria were met in all samples.

10. Furnace AA: All sample results were within control limits.

11. Sample Result Verification: The inventory sheet lists "Mercury Raw Data" from pp. 203-231. Actual mercury raw data is from pp. 203-213. Cyanide data is listed as "NA". The cyanide data exists on pp. 214-231.

No pages were missing, nor were any others mislabelled.

12. Overall Assessment of Data: The data package is acceptable with the following exceptions:

- a. One selenium concentration is rejected due to matrix spike recovery being too low.
- b. Beryllium data is subject to blank interference and flagged (B).
- c. Manganese and Lead are flagged (J) due to low matrix spike recovery.

CHEMICAL DATA SUMMARY

Site Name and Code: Miller Road Landfill, TXD980750590

Case Number: 20355

Concentrations in milligrams/kilogram (mg/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFBT19	MFBT20	MFBT21	MFBT22	MFBT23	MFBT24	MFBT25
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Solids	76.0	88.0	84.3	92.0	52.9	82.4	78.4
Location:	STA-01	STA-02	STA-03	STA-04	STA-05	STA-06	STA-07
and or Sample Description:							

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	6,370.0		22,200.0		18,200.0		32,100.0		22,200.0		19,500.0	
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	4.7		4.2		4.9		4.0	U	5.4		5.0	4.9
BARIUM	7440-39-3	INO	54.4		210.0		185.0		137.0		143.0		69.1	139.0
BERYLLIUM	7440-41-7	INO	1.0	U	1.0	U	1.0	U	1.2	B	1.1	B	1.0	U
CADMIUM	7440-43-9	INO												
CALCIUM	7440-70-2	INO	68,500.0		82,300.0		106,000.0		80,200.0		128,000.0		69,200.0	109,000.0
CHROMIUM	7440-47-3	INO	10.0		20.7		20.2		35.1		25.4		26.4	25.6
COBALT	7440-48-4	INO	9.0	U	9.0	U	10.1		11.2		10.1		9.0	U
COPPER	7440-50-8	INO	8.0		8.6		10.4		11.9		14.6		13.0	11.8
IRON	7439-89-6	INO	10,700.0		15,100.0		15,400.0		22,800.0		22,900.0		20,300.0	18,000.0
LEAD	7439-92-1	INO	7.1	J	14.4	J	41.2	J	18.5	J	19.6	J	16.6	J
MAGNESIUM	7439-95-4	INO	1,620.0		3,940.0		3,440.0		7,360.0		7,890.0		6,620.0	4,900.0
MANGANESE	7439-96-5	INO	319.0	J	434.0	J	855.0	J	283.0	J	394.0	J	175.0	338.0
MERCURY	7439-97-6	INO												
NICKEL	7440-02-0	INO	18.0	U	18.0	U	18.0	U	20.5		21.1		18.9	18.0
POTASSIUM	7440-09-7	INO	927.0		1,920.0		1,870.0		3,320.0		3,870.0		2,600.0	2,740.0
SELENIUM	7782-49-2	INO							5.5	R				
SILVER	7440-22-4	INO												
SODIUM	7440-23-5	INO	288.0		210.0		256.0		818.0		1,400.0		235.0	194.0
THALLIUM	7440-28-0	INO												
VANADIUM	7440-62-2	INO	19.1		37.8		42.5		57.7		44.9		36.1	48.7
ZINC	7440-66-8	INO	29.4		57.9		73.6		59.6		78.0		73.0	58.0
CYANIDE		INO	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U

LEGEND

INO - Inorganic

B - Blank Interference

J - The associated value is an estimated quantity.

R - Data for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Miller Road Landfill, TXD980750590
Case Number: 20355
Concentrations in milligrams/kilogram (mg/kg)
Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFBT25D	MFBT34	MFBT26	MFBT27	MFBT28	MFBT29	MFBT30
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Solids:	78.4	82.4	80.4	74.0	82.0	87.3	88.0
Location:	STA-07	STA-16	STA-08	STA-09	STA-10	STA-11	STA-12
and or Sample Description:	LABORATORY DUPLICATE		FIELD DUPLICATE				

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	24,668.9		26,200.0		29,700.0		32,200.0		25,400.0		36,000.0	
ANTIMONY	7440-38-0	INO												
ARSENIC	7440-38-2	INO	4.0	U	4.3		4.0	U	5.8		4.0	U	5.7	6.0
BARIUM	7440-39-3	INO	138.9		217.0		117.0		128.0		155.0		154.0	127.0
BERYLLIUM	7440-41-7	INO	1.1	B	1.2	B	1.2	B	1.2	B	1.0	U	1.5	B 1.2 B
CADMIUM	7440-43-9	INO												
CALCIUM	7440-70-2	INO	118,183.7		54,200.0		111,000.0		121,000.0		44,800.0		76,600.0	88,200.0
CHROMIUM	7440-47-3	INO	25.0		25.0		29.2		32.0		28.1		40.2	29.1
COBALT	7440-48-4	INO	9.0	U	10.4		9.0	U	9.0	U	17.0		13.4	10.9
COPPER	7440-50-8	INO	11.7		11.6		10.2		11.1		10.0		16.7	14.9
IRON	7439-89-6	INO	18,104.1		18,000.0		18,400.0		20,100.0		17,900.0		26,600.0	23,000.0
LEAD	7439-92-1	INO	18.0	J	196.0	J	12.7	J	22.0	J	13.3	J	24.3	18.4 U
MAGNESIUM	7439-95-4	INO	4,788.5		4,450.0		5,330.0		5,790.0		6,000.0		7,920.0	7,130.0
MANGANESE	7439-96-5	INO	445.5	J	516.0	J	250.0	J	272.0	J	957.0	J	443.0	198.0 J
MERCURY	7439-97-6	INO												
NICKEL	7440-02-0	INO	21.0		18.0	U	19.4		18.0	U	24.0		25.7	22.5
POTASSIUM	7440-09-7	INO	2,668.9		2,880.0		5,260.0		3,480.0		3,030.0		4,400.0	2,830.0
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO												
SODIUM	7440-23-5	INO	206.9		152.0		216.0		249.0		750.0		290.0	257.0
THALLIUM	7440-28-0	INO												
VANADIUM	7440-62-2	INO	47.4		51.5		50.5		54.2		48.1		56.8	44.8
ZINC	7440-66-6	INO	59.9		168.0		81.0		66.8		55.2		93.6	80.4
CYANIDE		INO	10.0	U	10.0	U	10.0	U	10.0	U	10.0	U	10.0	10.0 U

LEGEND

INO - Inorganic

B - Blank Interference

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UU - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

35,4

35-4

CHEMICAL DATA SUMMARY

Site Name and Code: Miller Road Landfill, TXD980750590
Case Number: 20355
Concentrations in milligrams/kilogram (mg/kg)
Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFBT31	MFBT32	MFBT33				
Matrix:	SOIL	SOIL	SOIL				
Percent Solids	64.7	58.8	52.0				
Location:	STA-13	STA-14	STA-15				
and or							
Sample							
Description:							

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	29,000.0		33,400.0		28,500.0									
ANTIMONY	7440-36-0	INO														
ARSENIC	7440-38-2	INO	5.9		7.7		4.6									
BARIUM	7440-39-3	INO	146.0		141.0		137.0									
BERYLLIUM	7440-41-7	INO	1.4	B	1.5	B	1.3	B								
CADMIUM	7440-43-9	INO														
CALCIUM	7440-70-2	INO	95,000.0		70,200.0		56,500.0									
CHROMIUM	7440-47-3	INO	34.3		39.9		32.6									
COBALT	7440-48-4	INO	9.6		11.3		9.0	U								
COPPER	7440-50-8	INO	17.2		16.6		16.4									
IRON	7439-89-6	INO	27,000.0		26,400.0		19,800.0									
LEAD	7439-92-1	INO	23.7	J	25.0	J	22.9	J								
MAGNESIUM	7439-95-4	INO	7,350.0		7,410.0		5,810.0									
MANGANESE	7439-96-5	INO	269.0	J	266.0	J	217.0	J								
MERCURY	7439-97-6	INO														
NICKEL	7440-02-0	INO	24.7		20.7		19.0									
POTASSIUM	7440-09-7	INO	3,360.0		4,240.0		3,020.0									
SELENIUM	7782-49-2	INO														
SILVER	7440-22-4	INO														
SODIUM	7440-23-5	INO	253.0		280.0		599.0									
THALLIUM	7440-28-0	INO														
VANADIUM	7440-62-2	INO	53.8		51.9		54.7									
ZINC	7440-68-6	INO	87.5		87.6		73.4									
CYANIDE		INO	10.0	U	10.0	U	10.0	U								

LEGEND

INO - Inorganic

B - Blank Interference

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Reference 36

**Inorganic Soil Data Validation Package for Miles Road
Landfill, October 28, 1993.**

DATA QUALITY ASSURANCE REVIEW

Site Name: Miles Rd. LF
Site Code: TXD980697072
Case Number: 20258

Laboratory: Silver Analytical Inc. - Kellogg, Idaho

Soil Samples: MFAP47, MFAP48, MFAP49, MFAP50,
MFAP51, MFAP52, MFAP53, MFAP54,
MFAP55, MFAP56, MFAP57, MFAP58

The data package consisted of 12 soil samples and one duplicate sample analyzed for TCL metals and cyanide:

1. Analytical Parameters: All samples were analyzed using multi-media, multi-concentration protocols.
2. Holding Times: All holding times were met.
3. Calibration Verification: All initial calibration verification results were within control limits. All continuing calibration verifications were conducted at the proper frequency and the results were within the control limits.
4. Blanks: All blanks were less than or equal to the IDL, except for vanadium. Analyte detected in blanks above IDL. All samples have analyte concentrations less than five times the IDL and these were flagged (B).
5. Matrix Spike Recoveries: %R for antimony is beyond acceptable limits, however, sample data was not affected.

%R for cadmium, chromium, copper, and zinc is <75%. Samples were listed as (J).
6. Duplicates: All analytes except zinc were within control limits. Zinc analyte data was flagged as (J).
7. Laboratory Control Samples: Quality control criteria were met in all samples.
8. ICP Interference Check Sample (ICS): ICP interference check samples were analyzed at the specified frequency and the results were within control limits.
9. ICP Serial Dilution: Quality control criteria were met in all samples. The %D listed for beryllium was incorrectly calculated to be 100.0. The correct value should be 42.0.

10. Furnace AA: The correlation coefficient for lead on sample MFAP53 was less than 0.995, as such, the analyte was flagged (J). All other samples met the quality control criteria.
11. Sample Result Verification: Data package had no missing or incorrectly numbered page.
12. Overall Assessment of Data: The data package was acceptable except for matrix spikes which affected the analytes cadmium, chromium, copper, and zinc.

CHEMICAL DATA SUMMARY

Site Name and Code: Miles Road Landfill, TXD980697072

Case Number: 20258

Concentrations in milligrams/kilogram (mg/kg)

Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP47	MFAP48	MFAP49	MFAP50	MFAP51	MFAP52	MFAP53
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL
Percent Solids	77.9	73.4	76.6	78.6	74.8	75.2	70.3
Location:	SS-01	SS-05	SS-07	SS-02	SS-04	SS-06	SS-03
and or							
Sample							
Description:					FIELD DUPLICATE OF MFAP48		

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	13,700.00		19,000.00		17,900.00		15,700.00		15,100.00		12,200.00	
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	4.30		7.60		4.30		9.40		3.30		3.50	
BARIUM	7440-39-3	INO	173.00		149.00		151.00		196.00		176.00		132.00	
BERYLLIUM	7440-41-7	INO												
CADMIUM	7440-43-9	INO	4.00	U	7.40	J	4.00	U	4.00	U	4.50	J	4.00	U
CALCIUM	7440-70-2	INO	71,600.00		81,700.00		56,300.00		13,400.00		77,300.00		47,500.00	
CHROMIUM	7440-47-3	INO	14.10	J	60.50	J	19.90	J	12.40	J	38.90	J	16.20	J
COBALT	7440-48-4	INO	11.50		7.50		12.70		9.00		7.70		10.40	
COPPER	7440-50-8	INO	15.00	J	74.20	J	19.60	J	9.50	J	46.80	J	21.40	J
IRON	7439-89-6	INO	18,700.00		18,900.00		20,600.00		10,100.00		18,200.00		17,000.00	
LEAD	7439-92-1	INO	18.30		28.00		23.10		31.40		29.50		28.40	
MAGNESIUM	7439-95-4	INO	4,690.00		5,790.00		4,380.00		1,950.00		5,180.00		3,790.00	
MANGANESE	7439-96-5	INO	628.00		305.00		556.00		367.00		305.00		411.00	
MERCURY	7439-97-6	INO	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
NICKEL	7440-02-0	INO	23.70		20.10		24.10		11.10		17.70		22.00	
POTASSIUM	7440-09-7	INO	1,830.00		2,510.00		2,330.00		947.00		2,060.00		1,840.00	
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
SODIUM	7440-23-5	INO	134.00		424.00		114.00		186.00		382.00		153.00	
THALLIUM	7440-28-0	INO												
VANADIUM	7440-62-2	INO	37.70	B	40.50	B	43.20	B	32.70	B	34.30	B	36.10	B
ZINC	7440-66-6	INO	59.70	J	180.00	J	74.50	J	28.70	J	142.00	J	75.60	J
CYANIDE		INO	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U

LEGEND

INO - Inorganic

B - Blank interference. Analyte conc. <5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UU - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

CHEMICAL DATA SUMMARY

Site Name and Code: Miles Road Landfill, TXD980697072
Case Number: 20258
Concentrations in milligrams/kilogram (mg/kg)
Compiled by: Fluor Daniel, Inc.

Traffic Number:	MFAP54	MFAP55	MFAP56	MFAP57	MFAP58	MFAP48D	
Matrix:	SOIL	SOIL	SOIL	SOIL	SOIL	SOIL	
Percent Solids	79.1	75.7	83.0	77.5	74.4	74.6	
Location:	SS-08	SD-09	SD-10	SD-11	SD-12	DUPLICATE	
and or							
Sample							
Description:						LAB DUPLICATE	

COMPOUND NAME	CAS NO.	CLASS	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C	Concentration	C
ALUMINUM	7429-90-5	INO	14,300.00		11,700.00		12,200.00		5,670.00		9,320.00		18,653.75	
ANTIMONY	7440-36-0	INO												
ARSENIC	7440-38-2	INO	4.70		4.20		6.30		6.00		5.60		5.15	
BARIUM	7440-39-3	INO	188.00		98.00		217.00		48.60		87.40		131.69	
BERYLLIUM	7440-41-7	INO												
CADMIUM	7440-43-9	INO	4.00	U	4.00	U	4.00	U	4.00	U	4.00	U	4.00	U
CALCIUM	7440-70-2	INO	90,500.00		81,600.00		101,000.00		227,000.00		199,000.00		79,124.41	
CHROMIUM	7440-47-3	INO	14.10	J	14.00	J	12.60	J	7.70	J	10.70	J	44.24	J
COBALT	7440-48-4	INO	8.50		7.10		11.30		10.10		6.50		7.52	
COPPER	7440-50-8	INO	13.80	J	16.30	J	12.50	J	10.40	J	9.90	J	44.69	J
IRON	7439-89-6	INO	15,700.00		20,500.00		15,100.00		13,000.00		10,800.00		19,243.91	
LEAD	7439-92-1	INO	22.00		17.80		30.60		10.80		14.80		28.24	
MAGNESIUM	7439-95-4	INO	2,890.00		5,730.00		3,400.00		1,920.00		2,530.00		5,535.54	
MANGANESE	7439-96-5	INO	306.00		286.00		581.00		660.00		753.00		262.48	
MERCURY	7439-97-6	INO	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U	0.20	U
NICKEL	7440-02-0	INO	16.10		19.60		20.20		18.70		16.70		19.91	
POTASSIUM	7440-09-7	INO	1,950.00		2,030.00		1,450.00		876.00		1,510.00		2,508.97	
SELENIUM	7782-49-2	INO												
SILVER	7440-22-4	INO	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U	5.00	U
SODIUM	7440-23-5	INO	76.00		160.00		152.00		335.00		270.00		418.09	
THALLIUM	7440-28-0	INO												
VANADIUM	7440-62-2	INO	34.10	B	30.80	B	36.90	B	22.90	B	30.70	B	41.48	B
ZINC	7440-66-6	INO	65.50	J	81.00	J	51.60	J	42.20	J	40.40	J	114.82	J
CYANIDE		INO	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U	10.00	U

LEGEND

INO - Inorganic

B - Blank interference. Analyte conc. <5x blank conc.

J - The associated value is an estimated quantity.

R - Date for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UU - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

Reference 37

**Inorganic Soil Data Validation Package for East Garland Road
Landfill, October 6, 1993.**

INORGANIC
DATA QUALITY ASSURANCE REVIEW

Site Name: East Garland Road LF

Site Code:

Case Number: 20354

Laboratory: Associated Laboratories -- Orange Ca.

Soil Samples: MFBT00, 01, 02, 03, 04, 05, 06, 07, 08, 09, 10, 11, 12, 13, 14, 15, 16, & 18.

The data package consisted of Eighteen soil samples analyzed for total metals and cyanide.

1. Analytical Parameters: All samples were analyzed using low concentration methods.
2. Holding Times: Holding time limits were reported as not having been exceeded.
3. Calibration Verification: All initial calibration verification results were within control limits. All continuing calibration verifications were reported to be within control limits.
4. CRDL Standards: the following parameters were out of compliance due to CRDL criteria - copper(159.2), mercury(150). Results in the affected range are estimated.
5. Blanks: calibration and prep blank results associated to a particular group of samples are used to qualify data. Trip blanks are used to qualify only those samples with which they were shipped and are not required for non-aqueous matrices. Typically, if sample concentration is greater than five times a blank value that is not considered a common lab artifact, no qualification is needed. If sample concentration is greater than ten times a blank value and is considered a common lab artifact, no qualification is needed. If the reported value is less than stated above, qualifications are applied in accordance with guidance. No field blank/trip blank/rinsate blank/ were reported to be associated with this SDG. Lab blanks as follows were reported as containing contamination greater than the IDL, but less than the CRDL: calcium, copper, iron, magnesium, potassium sodium, and vanadium. Affected samples were qualified as per guidance.
6. Matrix Spike Recoveries: Antimony, arsenic, copper, selenium and thallium were flagged by the lab with an "N" qualifier due to %R out of control limits. The data reviewer flagged these data "j", estimated. Antimony and arsenic results were qualified as unusable by a previous data reviewer. However, the SR concentration was qualified "u" (for antimony) and B for the SSR and SR(for arsenic), and therefore the results should be estimated, not rejected.
7. Duplicates: Laboratory duplicates were flagged with "*" by the lab indicating the RPD was out of control limits. The following data were reportedly affected: arsenic, copper, & selenium. Affected data were qualified "j". Field duplicates were identified as MFBT00 & 01. No gross variations were noted between field duplicate pairs.
8. Laboratory Control Samples: Barium(45.8), potassium(0), & Sodium(181) were reported as out of control limits. Qualifications as per guidance was performed.
9. ICP Interference Check Sample (ICS): ICS results were within control limits.

10. ICP Serial Dilution: the lab qualified aluminum(%D-11.8), barium(%D-12.9), calcium(%D-17.2), iron(%D-23.9), magnesium(%D-13.2), manganese(%D-20.2) with an E qualifier. This qualifier was changed to J.
11. Overall Assessment: Some laboratory duplicate results were out of control limits. Blank concentrations were above the IDL for some analytes. Furnace atomic absorption spike recoveries were outside of control limits for thallium. MSA analysis was not performed as required for arsenic on 10 samples. Matrix spike duplicates, and ICP serial dilutions were out of control limits for some analytes. Other technical requirements appear to have been met.

INORGANIC CHEMICAL DATA SUMMARY

Site Name and Code: East Garland Landfill
Case Number: 20354
Concentrations: In milligrams per kilogram (mg/kg)
Compiled by: Fluor Daniel

Inorganic Traffic No.			MFBT00		MFBT01		MFBT02		MFBT03		MFBT04		MFBT05		MFBT06	
Sample I.D.			SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Marb:			86.4		86.4		88.9		85.9		84.8		70.2		83.2	
Location:			STA-01		STA-02		STA-03		STA-04		STA-05		STA-06		STA-07	
and or																
Sample																
Description:																
COMPOUND NAME	CAS NO.	CLASS	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
ALUMINUM	7429-90-5	INO	19300	J	18700	J	25800	J	19800	J	22500	J	22200	J	21900	J
ANTIMONY	7440-36-0	INO	11.3	U	11.3	U	10.6	U	10.8	U	10.8	U	13.5	U	11.4	U
ARSENIC	7440-38-2	INO	7.4	J	6.1	J	4.6	U	4.8	U	5.1	U	8	U	4.9	U
BARIUM	7440-39-3	INO	109	J	93.6	J	118	J	117	J	108	J	142	J	134	J
BERYLLIUM	7440-41-7	INO	1.2		1.4		1.5		1.3		1.5		1.2		1.2	
CADMIUM	7440-43-9	INO	0.65	U	0.65	U	0.61	U	0.62	U	0.62	U	0.77	U	0.65	U
CALCIUM	7440-70-2	INO	162000	J	192000	J	144000	J	155000	J	91500	J	138000	J	175000	J
CHROMIUM	7440-47-3	INO	18.8		18.5		24		18.1		24		21.8		19.7	
COBALT	7440-48-4	INO	8.7		9.2		7.1		8.3		9		11		7.2	
COPPER	7440-50-8	INO	26.3	J	12.2	J	12.2	J	11.6	J	12.5	J	12.6	J	10	J
IRON	7439-89-6	INO	16100	J	17400	J	15700	J	15000	J	18400	J	18500	J	13700	J
LEAD	7439-92-1	INO	38.3		39.8		38.2		37.4		37.3		41.3		34.3	
MAGNESIUM	7439-95-4	INO	3420	J	3490	J	4260	J	3450	J	4300	J	3820	J	3620	J
MANGANESE	7439-96-5	INO	572	J	639	J	601	J	621	J	363	J	593	J	664	J
MERCURY	7439-97-6	INO	0.08	U	0.09	J	0.08	U	0.09	U	0.09	U	0.11	U	0.1	U
NICKEL	7440-02-0	INO	17.6		20.8		16		15.4		18.2		21.4		14.3	
POTASSIUM	7440-09-7	INO	2500		2240		2680		2310		3100		2450		2340	
SELENIUM	7782-49-2	INO	3.4	UJ	2.3	J	3.1	UJ	3.3	UJ	3.5	UJ	2.7	J	3.4	UJ
SILVER	7440-22-4	INO	0.76	U	0.76	U	0.71		0.73	U	0.73	U	0.91	U	0.78	U
SODIUM	7440-23-5	INO	262		271		173		212		219		233		169	
THALLIUM	7440-28-0	INO	0.36	UJ	0.36	UJ	0.33	UJ	0.35	UJ	0.37	UJ	0.43	UJ	0.36	UJ
VANADIUM	7440-62-2	INO	45.6		50.6		48.9		41.9		44.3		48.8		42	
ZINC	7440-66-8	INO	58		52.6		68.8		52.8		64.5		61.4		45.3	
CYANIDE		INO	2.9	U	2.9	U	2.7	U	2.9	U	2.9	U	3.5	U	3	U

LEGEND

INO - Inorganic

Q - Analytical results' Qualifier (listed below).

B - Analyte was detected above the CRDL but below 5X Blank Concentration.

J - The associated value is an estimated quantity.

R - Data for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

37-3

INORGANIC CHEMICAL DATA SUMMARY

Site Name and Code: East Garland Landfill
Case Number: 20354
Concentrations: In milligrams per kilograms (mg/kg)
Compiled by: Fluor Daniel

Inorganic Traffic No.			MFBT07		MFBT08		MFBT09		MFBT10		MFBT11		MFBT12		MFBT13	
Sample I.D.			SOIL		SOIL		SOIL		SOIL		SOIL		SOIL		SOIL	
Marix:			68		83		82.9		86.5		84.4		87.5		87.7	
Location:			STA-08		STA-09		STA-10		STA-11		STA-12		STA-13		STA-14	
and/or																
Sample																
Description:																
COMPOUND NAME	CAS NO.	CLASS	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
ALUMINUM	7429-90-5	INO	14300	J	16200	J	27700	J	23900	J	25800	J	22500	J	13200	J
ANTIMONY	7440-38-0	INO	15.2	U	11.8	U	11.2	U	11.2	U	11	U	11.5	U	10.8	U
ARSENIC	7440-38-2	INO	6.5	U	6.5	J	6.3	J	4.7	U	5.2	U	7.3	J	5	U
BARIUM	7440-39-3	INO	151	J	140	J	212	J	142	J	116	J	145	J	79.8	J
BERYLLIUM	7440-41-7	INO	0.83		1.3		1.4		1.2		1.3		1.3		0.75	
CADMIUM	7440-43-9	INO	0.87	U	0.68	U	15.2		5.3		2.9		5.6		0.62	U
CALCIUM	7440-70-2	INO	153000	J	168000	J	134000	J	161000	J	153000	J	132000	J	212000	J
CHROMIUM	7440-47-3	INO	16.2		14.4		159		60.9		34.9		60.7		15	
COBALT	7440-48-4	INO	8.3		3.9		7.1		5.9		8.3		8.7		6.4	
COPPER	7440-50-8	INO	15.7	J	10.4	J	152	J	62.7	J	30.9	J	71	J	8.8	J
IRON	7439-89-6	INO	11800	J	11800	J	17300	J	14600	J	17600	J	15000	J	11700	J
LEAD	7439-92-1	INO	13.8	J	67.8	J	105		53		48.5		61.4		36.3	
MAGNESIUM	7439-95-4	INO	2970	J	2920	J	3900	J	3780	J	4040	J	3440	J	2890	J
MANGANESE	7439-96-6	INO	584	J	678	J	556	J	562	J	619	J	635	J	805	J
MERCURY	7439-97-6	INO	0.11	U	0.74		0.79		0.47		0.14		0.24		0.08	U
NICKEL	7440-02-0	INO	16.6		14.8		22.2		17.4		17.2		22.9		16	
POTASSIUM	7440-09-7	INO	1630		1960		3150		2320		2670		2510		1280	
SELENIUM	7782-49-2	INO	0.59	J	3.5	UJ	3.5	UJ	3.2	UJ	3.5	UJ	3.2	UJ	0.34	J
SILVER	7440-22-4	INO	1	U	0.8	U	13.9		4.2		0.74	U	1.7		0.72	U
SODIUM	7440-23-5	INO	421		155		207		206		237		245		327	
THALIUM	7440-28-0	INO	0.48	UJ	0.37	UJ	0.37	UJ	0.34	UJ	0.38	UJ	0.34	UJ	0.36	UJ
VANADIUM	7440-62-2	INO	33.3		34.9		49.4		48.8		52		47.7		37.2	
ZINC	7440-66-6	INO	60.2		39.9		365		143		94.3		161		36.5	
CYANIDE		INO	3.7	U	2.9	U	3	U	2.8	U	2.9	U	2.8	U	2.9	U

LEGEND

INO - Inorganic

Q - Analytical results' Qualifier (listed below).

B - Analyte was detected above the CRDL but below 5X Blank Concentration.

J - The associated value is an estimated quantity.

R - Data for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

INORGANIC CHEMICAL DATA SUMMARY

Site Name and Code: East Garland Landfill
Case Number: 20354
Concentrations: In milligrams per kilogram (mg/kg)
Compiled by: Fluor Daniel

Inorganic Traffic No.			MFBT14		MFBT15		MFBT16		MFBT18					
Sample I.D.			SOIL		SOIL		SOIL		SOIL					
Marb:			90.1		86.9		82.9		85.1					
Percent Solids														
Location:			STA-15		STA-16		STA-17		STA-19					
and or														
Sample														
Description:														
COMPOUND NAME	CAS NO.	CLASS	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q	Concentration	Q
ALUMINUM	7429-90-5	INO	16700	J	30700	J	21400	J	28500	J				
ANTIMONY	7440-38-0	INO	10.7	U	10.8	U	11.5	U	11.7	U				
ARSENIC	7440-38-2	INO	4.8	U	4.7	U	5.8	J	9.2	J				
BARIUM	7440-39-3	INO	96.7	J	160	J	135	J	171	J				
BERYLLIUM	7440-41-7	INO	1.1		1.6		1.4		1.6					
CADMIUM	7440-43-9	INO	0.61	U	0.62	U	6.1		0.67	U				
CALCIUM	7440-70-2	INO	193000	J	126000	J	142000	J	82200	J				
CHROMIUM	7440-47-3	INO	16.3		25.4		50.6		27.5					
COBALT	7440-48-4	INO	8.1		5.2		10.3		11.6					
COPPER	7440-50-8	INO	9.7	J	9.6	J	78.4	J	15	J				
IRON	7439-89-6	INO	12900	J	17000	J	15700	J	19300	J				
LEAD	7439-92-1	INO	29.7		44.7		49.5		51.7					
MAGNESIUM	7439-95-4	INO	3090	J	3390	J	3590	J	4020	J				
MANGANESE	7439-96-5	INO	860	J	305	J	906	J	1080	J				
MERCURY	7439-97-6	INO	0.09	U	0.09	U	0.19		0.09	U				
NICKEL	7440-02-0	INO	16.9		16.5		24.2		21.9					
POTASSIUM	7440-09-7	INO	1580		1930		2180		3770					
SELENIUM	7782-49-2	INO	3.3	UJ	3.2	UJ	3.3	UJ	2.4	J				
SILVER	7440-22-4	INO	0.72	U	0.72	U	1.5		0.78	U				
SODIUM	7440-23-5	INO	319		139		197		133					
THALLIUM	7440-28-0	INO	0.35	UJ	0.34	UJ	0.35	UJ	0.34	UJ				
VANADIUM	7440-62-2	INO	42.4		48.4		47.9		59.9					
ZINC	7440-66-8	INO	38.6		49.6		168		83.6					
CYANIDE		INO	2.7	U	2.8	U	3	U	2.9	U				

LEGEND

INO - Inorganic

Q - Analytical results' Qualifier (listed below).

B - Analyte was detected above the CRDL but below 5X Blank Concentration.

J - The associated value is an estimated quantity.

R - Data for analyte is unusable.

U - The material was analyzed for but was not detected above the level of the associated value.

UJ - The material was analyzed for but was not detected. The associated value is an estimate and may be inaccurate or imprecise.

37,5

37-5

Reference 38

**U.S. Department of the Interior, Geologic Survey,
Professional Paper 574-D "Elemental Composition of Surficial
Materials in the Conterminous United States", H. T.
Shacklette et. al., 1971.**



Elemental Composition of Surficial Materials in the Conterminous United States

By HANSFORD T. SHACKLETTE, J. C. HAMILTON,
JOSEPHINE G. BOERNGEN, and JESSIE M. BOWLES

STATISTICAL STUDIES IN FIELD GEOCHEMISTRY

GEOLOGICAL SURVEY PROFESSIONAL PAPER 574-D

*An account of the amounts of certain chemical
elements in samples of soils and other regoliths*



CONTENTS

38-2

	Page		Page
Abstract	D1	Collection and analysis of geochemical data—Con.	
Introduction	1	Sampling media	D4
Acknowledgments	1	Chemical analysis procedures	4
Review of the literature	2	Methods of statistical analysis	5
Collection and analysis of geochemical data	2	Results	6
Sampling plan	2	Discussion and conclusions	6
		References cited	7

ILLUSTRATIONS

	Page		Page
1. Map showing location of sample sites in the conterminous United States where elements not commonly detected in surficial deposits were found, and the amounts of the elements present	D10	FIGURES 2-31. Maps showing element content of surficial materials in the conterminous United States—Continued	
2-31. Maps showing element content of surficial materials in the conterminous United States:		14. Lead	D36
2. Aluminum	12	15. Magnesium	38
3. Barium	14	16. Manganese	40
4. Beryllium	16	17. Molybdenum	42
5. Boron	18	18. Neodymium	44
6. Calcium	20	19. Nickel	46
7. Cerium	22	20. Niobium	48
8. Chromium	24	21. Phosphorus	50
9. Cobalt	26	22. Potassium	52
10. Copper	28	23. Scandium	54
11. Gallium	30	24. Sodium	56
12. Iron	32	25. Strontium	58
13. Lanthanum	34	26. Titanium	60
		27. Vanadium	62
		28. Ytterbium	64
		29. Yttrium	66
		30. Zinc	68
		31. Zirconium	70

TABLES

	Page
1. Average contents, and range in contents, reported for elements in soils and other surficial materials	D3
2. Analytical limits of detection	5
3. Geometric mean compositions, and geometric deviations, of samples of soils and other surficial materials in the conterminous United States	7

38,2

STATISTICAL STUDIES IN FIELD GEOCHEMISTRY

ELEMENTAL COMPOSITION OF SURFICIAL MATERIALS
IN THE CONTERMINOUS UNITED STATES

By HANSFORD T. SHACKLETTE, J. C. HAMILTON, JOSEPHINE G. BOERNGEN, and JESSIE M. BOWLES

ABSTRACT

Samples of soils or other regoliths, taken at a depth of approximately 8 inches from locations about 50 miles apart throughout the conterminous United States, were analyzed for their content of elements. In this manner, 863 sample sites were chosen, and the results of the sample analyses for 35 elements were plotted on maps. The arithmetic and geometric mean, the geometric deviation, and a histogram showing frequencies of analytical values are given for 30 elements.

Surficial materials of the western half of the United States generally contain more calcium, magnesium, strontium, potassium, sodium, aluminum, and barium, but contain less titanium and zirconium than do those of the eastern half. Surficial materials in the Atlantic Coastal Plain tend to have much lower concentrations of most metals than are common in those of other regions, whereas these materials in the Basin and Range province, in parts of the Rocky Mountains, and in Maine and adjacent States generally have high metal concentrations. Some smaller patterns of element abundance can be noted, but the degree of confidence in the validity of these patterns decreases as the patterns become less extensive.

INTRODUCTION

The abundances of certain chemical elements in soils and other surficial materials are determined not only by the element content of the bedrock or other deposits from which the materials originated, but also by the effects of climatic and biological factors that have acted on the materials for various periods of time. The diversity of these factors in a large area is expected to result in a corresponding diversity in the element contents of the surficial materials.

At the beginning of this study, few data were available on the abundance of the elements in surficial materials of the United States as a whole. Most of the early reports discussed only the elements that were of economic importance to mining or agriculture in a metallogenic area or State; and the data, for the most part, cannot be evaluated with reference to average, or "normal," amounts in undisturbed materials because they were based on samples of deposits expected to have anomalous amounts of cer-

tain elements, or were based only on samples from cultivated fields.

We began a sampling program in 1961 that was designed to give estimates of the range of element abundance in surficial materials that were unaltered or very little altered from their natural condition, and in plants that grew on these deposits, throughout the conterminous United States. Because of the great amount of travel necessary to complete this program, geologists and others of the U.S. Geological Survey were asked to assist by collecting samples when traveling to and from project areas and to contribute appropriate data that they might have collected for other purposes. The response to this request, together with the samples and data that we collected, resulted in obtaining samples of surficial materials and plants from 863 sites. The locations of these sites are shown on the maps of element distributions in this report.

The elemental compositions of only the surficial materials are given in this report; the data on analyses of the plant samples are held in files of the U.S. Geological Survey.

ACKNOWLEDGMENTS

This study was made possible by the cooperation of many persons in the U.S. Geological Survey. We thank Messrs. D. F. Davidson, A. T. Miesch, and A. T. Myers for their interest in, and continued support of, this study. The sampling plan was suggested by Mrs. Helen L. Cannon, who also contributed analytical data from her project areas and many samples from her travel routes. We thank also Messrs. E. V. Post and W. R. Griffiths for the large number of samples that they collected for this study. Others who collected samples, and to whom we express gratitude, follow: F. A. Branson, R. A. Cadigan, F. C. Canney, F. W. Cater, Jr., Todd Church, J. J. Connor, Dwight Crowder, J. A. Erdman, G. B. Gott, T. P. Hill, E. K. Jenne, J. R. Keith,

TABLE 1.—Average contents, and range in contents, reported for elements in soils and other surficial materials
(Data are in parts per million; each average represents arithmetic mean; -----, no data available)

38-4

Element	Present report		Hawkes and Webb (1962) (elements useful in geo- chemical prospecting)		Vinogradov (1959) (presumably, averages from worldwide sampling)	Jackson (1964)	Mitchell (1964)
	Average	Range	Average	Range		"Typical" average, or range in values	Range in content of Scottish surface soils
Al -----	66,000	700->100,000			71,300	10,000-60,000	
B -----	34	<20-300	10		10	30	
Ba -----	554	15-5,000	500	100-3,000	500		400-3,000
Be -----	1	<1-7	6		6		<5-5
Ca -----	24,000	<150-320,000			13,700	7,000	
Ce -----	86	<150-300			50		
Co -----	10	<3-70	8	1-40	8		<2-80
Cr -----	53	1-1,500	200	5-1,000	200		5-3,000
Cu -----	25	<1-300	20	2-100	20		<10-100
Fe -----	25,000	100->100,000		14,000-40,000	38,000	7,000-42,000	
Ga -----	19	<5-70			30		15-70
K -----	23,000	50-70,000			13,600	400-28,000	
La -----	41	<30-200	40		40		<30-200
Mg -----	9,200	50-100,000			6,300	<6,000	
Mo -----		<3-7	2	0.2-5	2	1-10	<1-5
Mn -----	560	<1-7,000	850	200-3,000	850		200-5,000
Na -----	12,000	<500-100,000			6,300		
Nb -----	13	<10-100					
Nd -----	45	<70-300					
Ni -----	20	<5-700	40	5-500	40		10-800
P -----	420	20-6,000			800	500	
Pb -----	20	<10-700	10	2-200	10		<20-80
Sc -----	10	<5-50			7		<3-15
Sr -----	240	<5-3,000			300		60-700
Ti -----	3,000	300-15,000	4,600	1,000-10,000	4,600	1,200-6,000	
V -----	76	<7-500	100	20-500	100		20-250
Y -----	29	<10-200			50		25-100
Yb -----	4	<1-50					
Zn -----	54	<25-2,000	50	10-300	50		
Zr -----	240	<10-2,000			300		200->1,000

of time and funds available—and its variance from an ideal plan has been recognized from the beginning. Because the collection of most samples was, by necessity, incidental to other duties of the samplers, the instructions for sampling were simplified as much as possible, so that sampling methods would be consistent within the wide range in kinds of sites to

be sampled. The samples, other than those from certain project areas, were collected by U.S. Geological Survey personnel along their routes of travel to areas of other types of field studies.

The locations of the routes that were sampled depended on both the network of roads that existed and the destinations of the samplers. Sampling intensity

ELEMENTAL COMPOSITION OF SURFICIAL MATERIALS, CONTERMINOUS UNITED STATES D7

TABLE 3.—Geometric mean compositions, and geometric deviations, of samples of soils and other surficial materials in the conterminous United States

[Geometric means reported in parts per million. Too few molybdenum values were available to make a statistical evaluation]

Element	The conterminous United States N=863		Western United States (west of 97th meridian) N=492		Eastern United States (east of 97th meridian) N=371	
	Geometric mean	Geometric deviation	Geometric mean	Geometric deviation	Geometric mean	Geometric deviation
Al	45,000	2.41	54,000	2.02	33,000	2.70
B	26	2.05	22	2.09	32	1.92
Ba	430	2.06	560	1.80	300	2.19
Be	0.6	2.49	0.6	2.47	0.6	2.53
Ca	8,800	3.92	18,000	2.93	3,200	2.87
Ce	75	1.67	74	1.64	78	1.70
Co	7	2.21	8	2.01	7	2.55
Cr	37	2.32	38	2.16	36	2.52
Cu	18	2.28	21	2.00	14	2.54
Fe	18,000	2.30	20,000	1.90	15,000	2.76
Ga	14	2.11	18	1.71	10	2.53
K	12,000	2.71	17,000	1.60	7,400	3.56
La	34	1.85	35	1.81	33	1.90
Mg	4,700	3.19	7,800	2.21	2,300	3.39
Mn	340	2.70	389	1.94	285	3.65
Na	4,000	4.11	10,200	1.98	2,600	4.11
Nb	12	1.66	11	1.74	13	1.54
Nd	39	1.72	36	1.81	44	1.61
Ni	14	2.26	16	2.03	13	2.60
P	250	2.74	320	2.33	180	3.03
Pb	16	1.96	18	1.93	14	1.96
Sc	8	1.79	9	1.74	7	1.85
Sr	120	3.39	210	2.12	51	3.56
Ti	2,500	1.87	2,100	1.82	3,000	1.84
V	56	2.16	66	1.91	46	2.41
Y	24	1.77	25	1.66	23	1.93
Zn	3	1.81	3	1.67	3	2.03
Zr	44	1.86	51	1.78	36	1.89
	200	1.90	170	1.78	250	1.95

istics which form the patterns are the result of chance.

Some small- and intermediate-scale features of element-abundance patterns are known to reflect geological characteristics of the areas that the soils overlie. A few soil samples with high phosphorous content, for example, are associated with phosphate deposits in Florida, and a single sample with high copper content from the Upper Peninsula of Michigan is known to be of soil that occurs over a copper deposit. Samples from most of the regoliths overlying basic volcanic rocks of Washington and Oregon contained higher than average concentrations of iron and of a few other elements.

These data do not provide consistent evidence of north-south trends in elemental compositions that might be expected to relate to differences in temperature regimes under which the surficial materials developed. There is, moreover, no evidence of significant differences in element abundances between glaciated and nonglaciated areas (the general area

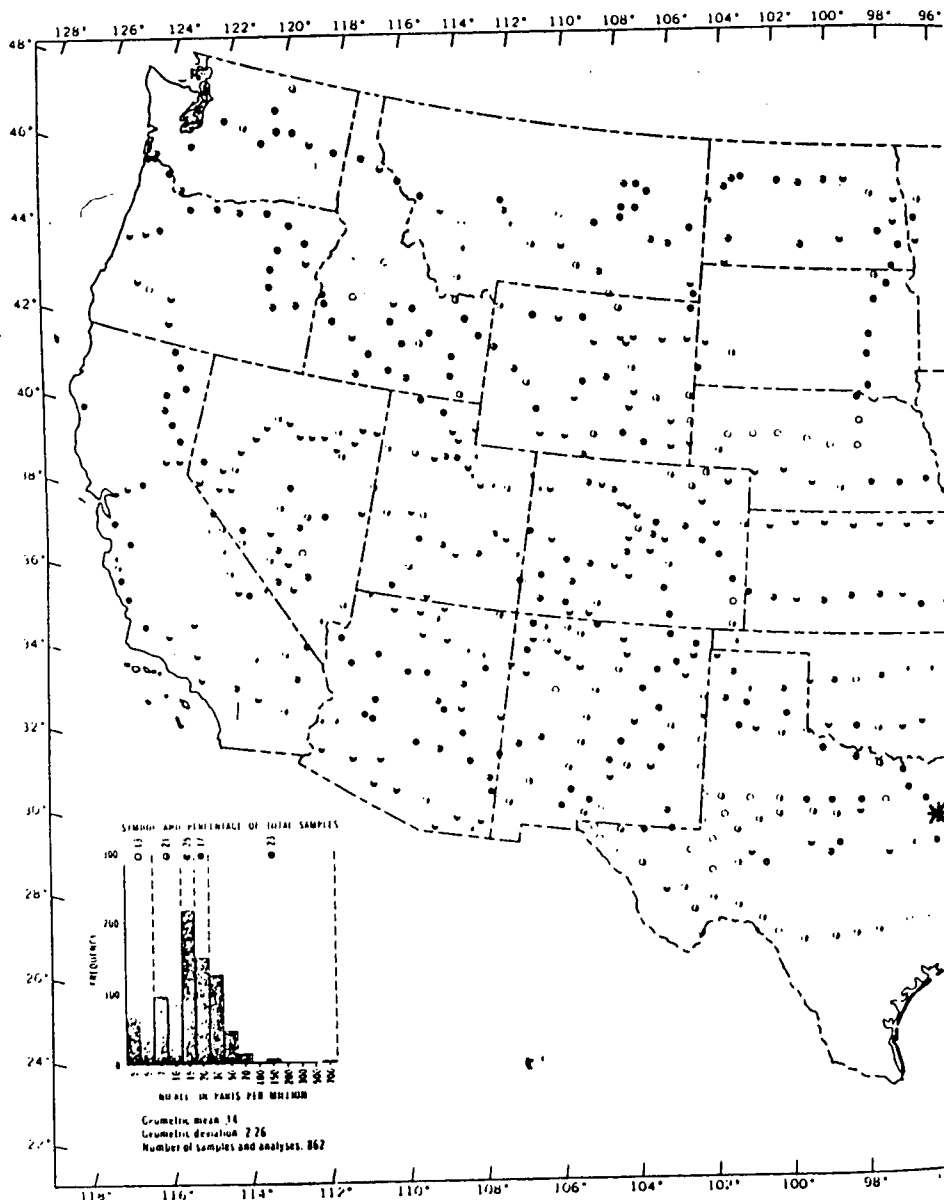
of continental glaciation includes the northern tier of States from Montana to Maine and south in places to about lat 40° N.).

The world averages of abundance for some elements in soils, as given by Vinogradov (1959) and by others (table 1), do not correspond to the averages of abundance for those elements in soils of the United States, according to the data presented in this report. The world averages are too low for the amounts of boron, calcium, cerium, lead, magnesium, potassium, and sodium in United States soils, and too high for beryllium, chromium, gallium, manganese, nickel, phosphorus, titanium, vanadium, and yttrium. This report presents, for the first time, averages of the abundance of niobium, neodymium, and yttrium in soils.

REFERENCES CITED

- Bear, F. E., ed., 1964, Chemistry of the soil [2d ed.]: New York, Reinhold Publishing Corp., 515 p.
Cannon, H. L., and Bowles, J. M., 1962, Contamination of

STATISTICAL STUDIES IN FIELD GEOCHEMISTRY



ELEMENTAL COMPOSITION OF SURFICIAL MATERIALS, CONTERMINOUS UNITED ST

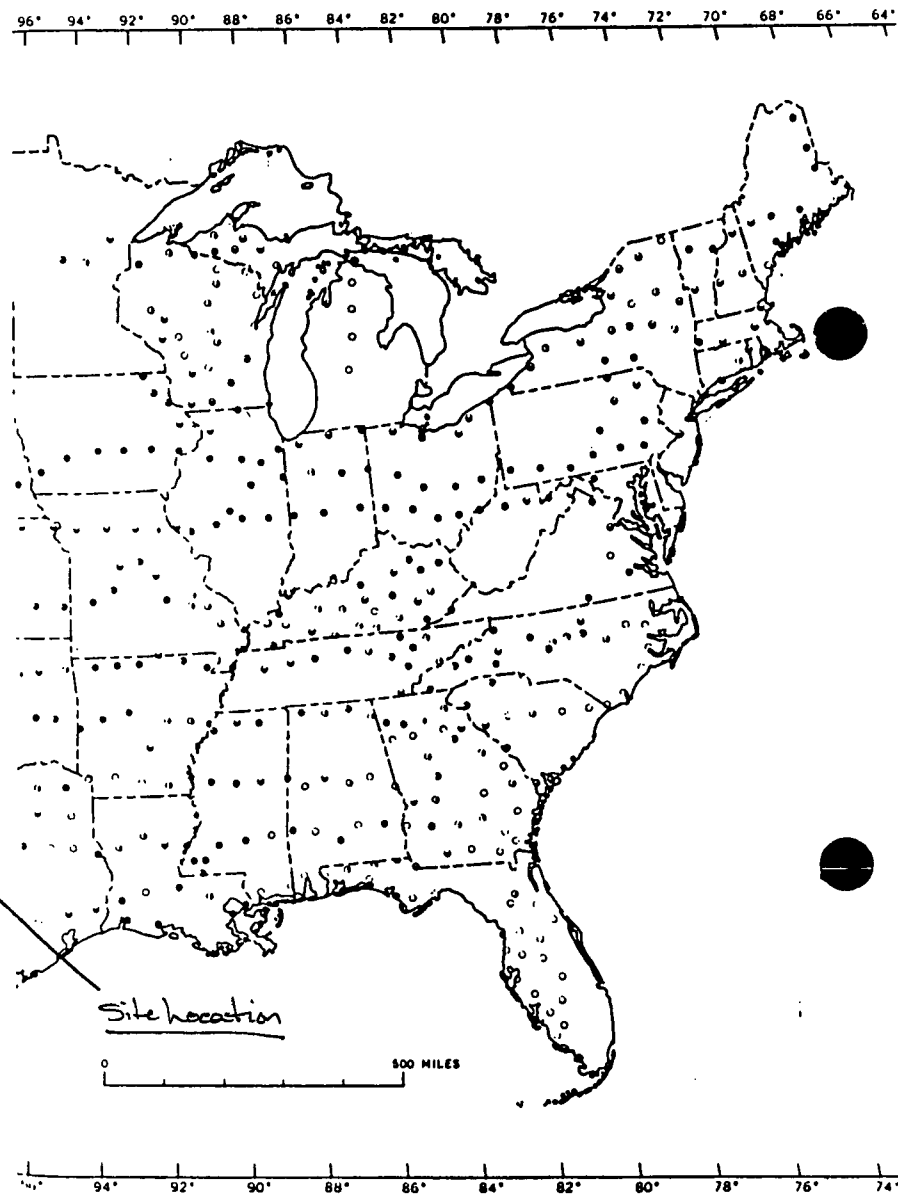








FIGURE 19.—Nickel content of surficial materials.

Reference 39

**Sampling Location Map, Miles Road Landfill, Fluor Daniel,
September, 1993.**

LEGEND:

 FENCE
 ROADS
 SITE AREA

 PROPOSED SAMPLE LOCATION
 DUPLICATE SAMPLE
 WASTE DISPOSAL AREA

(Off-scale samples: Sample 11 and 12 will be Rowlett Creek Sediment Samples located above and below the PPE, respectively. Samples 13 and 14 will be at the (b) (6) drinking water well. Sample 15 is the Trip Blank.

Undisturbed Field and Brush

Drainage
To Rowlett Creek

10

City of Garland Power Right of Way

Old Burning Dump

Miles Road Landfill

Pond

Residences

N

Agricultural Land/Pasture Land

Castle
Drive
Landfill

Castle Drive and
Miles Road
Landfill

Note: Compiled from USGS, Rowlett, Tex, 1959,
Photorevised 1968 and 1973; and "Dallas Street
Guide and Directory", MAPSCO, Inc., 1992.

Not to Scale

Sample Locations
Miles Road Landfill
Garland, Texas



FIGURE 3

O:\OS1111\209\01217.DRW

Access Road

Castle Drive

Toler Rd

16

Church



(b) (6)

well

Reference 40

**Castle Drive Landfill Site Reconnaissance Photolog,
Fluor Daniel, September, 1993.**

Photo No.

5



Site Name:

Castle Landfill

CERCLIS # TXD980626766

Photographer/Witness

William Walters/Keith Westberry

Location:

Date

5/11/93

Time Afternoon

Direction North

Garland, Texas

Description

Photo of western side slope of landfill. Monitoring well number can be seen to the left of the photo.

Project #:

WA #25-6JZZ

Photo No.

6



Photographer/Witness

William Walters/Keith Westberry

Date

5/11/93

Time Afternoon

Direction South

Description

Photo of natural pond in the south central area of the site. Pasture, with cows visible, south of the site can be seen in the background.

Reference 41

**Record of Telephone Conversation between William Walters,
Fluor Daniel, and Ken Smith, Landfill Director, City of Garland
Sanitation Department, November 12, 1993.**

RECORD OF TELEPHONE CONVERSATION

FROM: William Walters, FD *WW*

DATE: November 12, 1993

LOCATION: Irvine, CA

TIME: 7:30 a.m. PST

TO: Ken Smith, Landfill Director,
City of Garland Sanitation Department
(214) 205-2713

P.O. NO. 635336,40

OTHER REF. ARCS

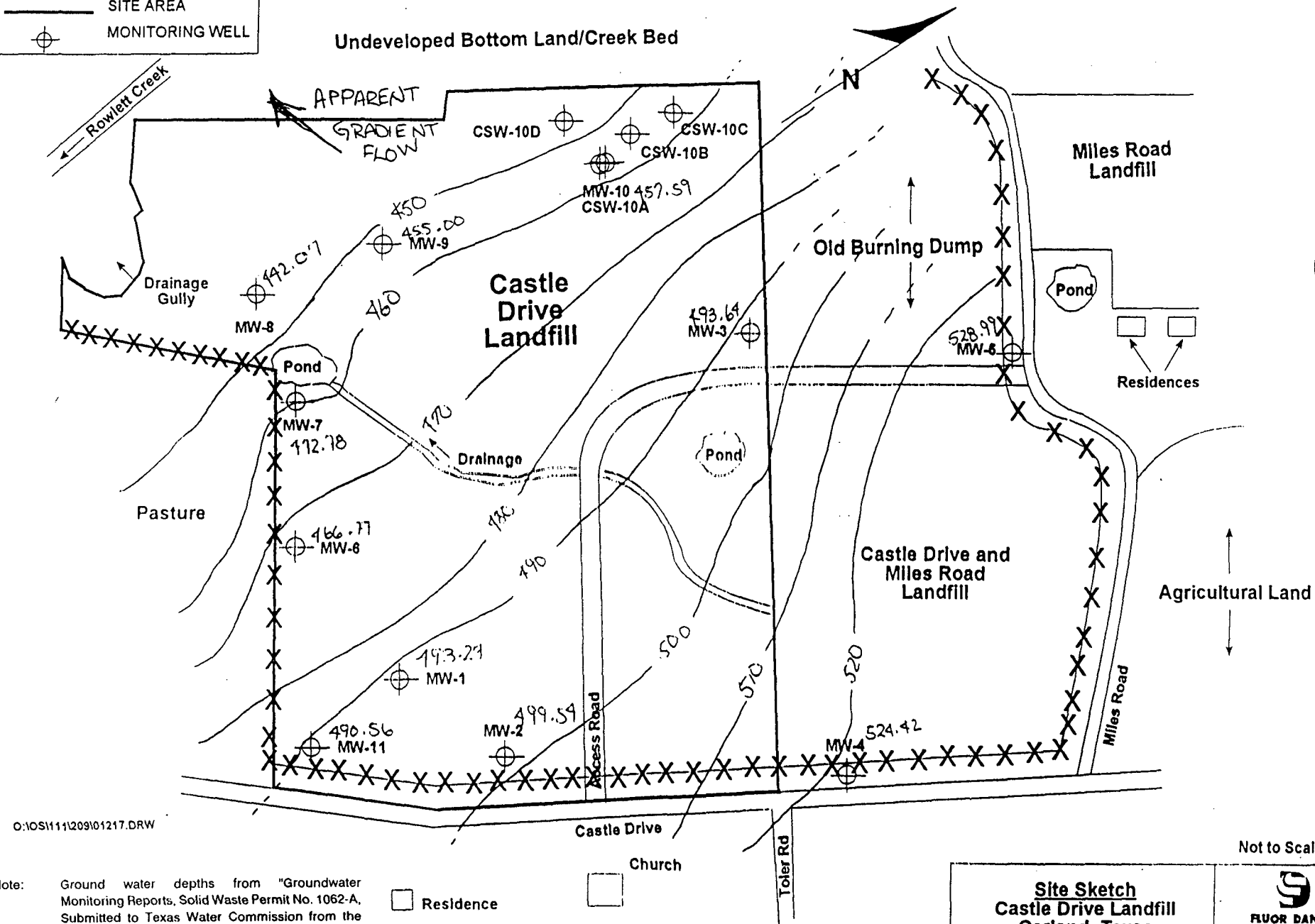
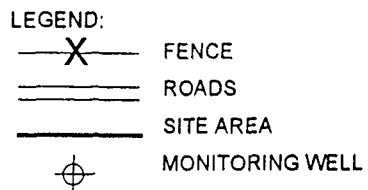
LOCATION: Garland, TX

This call was made to document issues discussed with Ken Smith during the reconnaissance visit and sampling investigation.

- 1) The Castle Landfill portion of the operating landfill started operation on April 26, 1978. The Castle Miles Landfill portion of the operating landfill started operation on October 16, 1984.
- 2) No soils samples have been taken at the operating landfill (Castle Landfill, Castle Miles Landfill) since operation began.
- 3) The ground water flow in the area of the operating landfill is to the north or northwest, in the same orientation as "Characterization Study Wells" 10A, 10B and 10C were drilled.

Reference 42

**Ground Water Gradient Map, Leigh Agee, Fluor Daniel,
3/11/94.**



O:\OS111\209\01217.DRW

Reference 43

**Groundwater Monitoring Report, Solid Waste Permit
No. 1062-A, Submitted to Texas Water Commission
from the City of Garland, February 4, 1993.**



City of Garland

Post Office Box 469002 / Garland, Texas 75046-9002

MSW 01062

February 4, 1993

CERTIFIED MAIL RECEIPT #816 943 374
RETURN RECEIPT REQUESTED

Ms. Nancy Frank - Section Manager
Ground Water Protection - MSW Division
Texas Water Commission
P.O. Box 13087
Austin, Texas 78711-3087

Re: Solid Waste Permit No. 1062-A
Groundwater Monitoring Reports

Dear Ms. Frank:

Submitted herein are the completed Ground Water Monitoring Reports for the referenced landfill. Backup data from NDRC Laboratories, Inc. for each well, and quality control reports for the period of testing, are also enclosed. The ground water samples from MW-8A were analyzed for the background parameters (Groups 1 through 4) per instruction from the Texas Water Commission (TWC). All remaining wells were analyzed for Groups 2, 3 and 4. The parameters analyzed were generally within historical ranges except for slightly higher values of magnesium in MW-5 AND -6, Sodium in MW-1 and -5, bicarbonate in MW-4, -6, and -9 through -11, specific conductance in MW-3 and -4, and manganese in MW-6.

Should you have any questions, please call Ronald F. Reed, Reed Engineering Group at (214) 350-5600.

Sincerely,

Attachments
a/s

Ken Smith
Deputy Managing Director
Environmental Resources and Services

KS/ejn

SOLID WASTE MGMT.

1993 FEB -9 PM 3:18

reed engineering
GROUP

GEOTECHNICAL CONSULTANTS

1993 FEB -11 PM 12:01

ENVIRONMENTAL RESOURCES & SERVICES

January 25, 1993
Project No. 515.13

Mr. Lonnie Banks
City of Garland
P.O. Box 469002
Garland, Texas 75046-9002

Re: Solid Waste Permit No. 1062-A
Groundwater Monitoring Reports

Dear Mr. Banks:

Submitted herein are the completed Ground Water Monitoring Reports for the referenced landfill. Back-up data from NDRC Laboratories, Inc. for each well, and quality control reports for the period of testing, are also enclosed. The ground water samples from MW-8A were analyzed for the background parameters (Groups 1 through 4) per instruction from the Texas Water Commission (TWC). All remaining wells were analyzed for Groups 2, 3 and 4. The parameters analyzed were generally within historical ranges except for slightly higher values of magnesium in MW-5 and -6, sodium in MW-1 and -5, bicarbonate in MW-4, -6, and -9 through -11, specific conductance in MW-3 and -4, and manganese in MW-6.

Please sign and date the original Groundwater Monitoring Reports at the bottom ("Site Operator Signature") and submit the originals to the TWC.

Should you have any questions, do not hesitate to call.

Sincerely,

THE REED ENGINEERING GROUP


F. Whitney Smith, R.G.


Ronald F. Reed, P.E.

FWS/RFR/aap

copies submitted: (1)

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G WATER MONITORING P

TDH Permit No. 1062-A Monitoring Well I.D. No. MW-1 (D92-14836-9)
 Submittal for [] Background Data [] Semiannual/Annual Data [X] Fourth Year Data
 Purpose of: Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator [] Consultant [X] Laboratory Personnel []
 Well Purged/Bailed Before Sampling: Yes [X] No [] How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 10.48 ft Elev 493.27 MSL
 How Were Samples Collected: Dedicated pump
 Were sample preservation procedures in accordance with TDH Guidelines: Yes [X] No []

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	185.	mg/l	EPA 6010
	Magnesium	8.64	mg/l	EPA 6010
	Sodium	120.	mg/l	EPA 6010
	Potassium	1.4	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	741.	mg/l	Std. Method 403
	Sulphate	25.	mg/l	EPA 9038
	Fluoride	0.4	mg/l	EPA 340.2
	Nitrate (N)	<0.01	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	608.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	550.	mg/l	EPA 130.2
	Anion-Cation Balance	15.1/15.4	meq/meq	Std. Method 1030F
3	Chloride	86.8	mg/l	EPA 9252
	pH	6.9		EPA 9040
	Specific Conductance	1370	µmho/cm	EPA 120.1
	Total Dissolved Solids	811	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	2.77	mg/l	EPA 6010
	Manganese	0.14	mg/l	EPA 6010

Laboratory Representative Signature: Yvonne H. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93 (SE65)

GROUNDWATER MONITORING REPORT

TDH Permit No. 1062-A Monitoring Well I.D. No. MW-2 (D92-14561-1)
 Submittal for: ☐ Background Data ☐ Semiannual/Annual Data ☐ Fourth Year Data
 Purpose of: Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/18/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 14.86 ft Elev 499.54 MSL
 How Were Samples Collected: Dedicated pump.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	125.	mg/l	EPA 6010
	Magnesium	4.75	mg/l	EPA 6010
	Sodium	12.0	mg/l	EPA 6010
	Potassium	1.2	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	460.	mg/l	Std. Method 403
	Sulphate	16.	mg/l	EPA 9038
	Fluoride	0.3	mg/l	EPA 340.2
	Nitrate (N)	1.09	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	337.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	290.	mg/l	EPA 130.2
	Anion-Cation Balance	7.42/7.19	meq/meq	Std. Method 1030F
3	Chloride	8.9	mg/l	EPA 9252
	pH	7.1		EPA 9040
	Specific Conductance	588	µmho/cm	EPA 120.1
	Total Dissolved Solids	392	mg/l	EPA 160.1
	Total Organic Carbon	2.4	mg/l	EPA 9060
	Total Organic Carbon	1.9	mg/l	EPA 9060
	Total Organic Carbon	2.0	mg/l	EPA 9060
	Total Organic Carbon	1.9	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	0.13	mg/l	EPA 6010

Laboratory Representative Signature: Maria H. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93 (SE65)

GROUNDWATER MONITORING REPORT

TDH Permit No. 1062-A Monitoring Well I.D. No. MW-3A (D92-14812-1)
 Submittal for [] Background Data [] Semiannual/Annual Data ☒ Fourth Year Data
 Purpose of: Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/28/92 No. Lt. Bottles Collected: 3+voa Sampled by: Reed Engineering Group
 Representing: Site Operator [] Consultant ☒ Laboratory Personnel []
 Well Purged/Bailed Before Sampling: Yes ☒ No [] How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 46.48 ft Elev 493.64 MSL
 How Were Samples Collected: Dedicated pump.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No []

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	190.	mg/l	EPA 6010
	Magnesium	16.1	mg/l	EPA 6010
	Sodium	87.3	mg/l	EPA 6010
	Potassium	1.3	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	797.	mg/l	Std. Method 403
	Sulphate	<1.0	mg/l	EPA 9038
	Fluoride	0.6	mg/l	EPA 340.2
	Nitrate (N)	0.54	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	654.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	540.	mg/l	EPA 130.2
	Anion-Cation Balance	14.9/14.7	meq/meq	Std. Method 1030F
3	Chloride	62.0	mg/l	EPA 9252
	pH	6.8		EPA 9040
	Specific Conductance	1310	µmho/cm	EPA 120.1
	Total Dissolved Solids	822	mg/l	EPA 160.1
	Total Organic Carbon	3.3	mg/l	EPA 9060
	Total Organic Carbon	2.8	mg/l	EPA 9060
	Total Organic Carbon	3.1	mg/l	EPA 9060
	Total Organic Carbon	2.7	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	1.49	mg/l	EPA 6010

Laboratory Representative Signature: Dyana H. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 1-4-93 (SE65)

G D WATER MONITORING

Submittal for TDH Permit No. 1062-A Monitoring Well I.D. No. MW-4 (D92-14561-2)
 Purpose of: ☐ Background Data ☐ Semiannual/Annual Data ☒ Fourth Year Data
 Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/18/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 10.83 ft Elev 524.42 MSL
 How Were Samples Collected: Dedicated pump
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	110.	mg/l	EPA 6010
	Magnesium	9.73	mg/l	EPA 6010
	Sodium	60.	mg/l	EPA 6010
	Potassium	<0.1	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	439.	mg/l	Std. Method 403
	Sulphate	39.0	mg/l	EPA 9038
	Fluoride	0.6	mg/l	EPA 340.2
	Nitrate (N)	1.29	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	360.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	290.	mg/l	EPA 130.2
	Anion-Cation Balance	8.89/8.94	meq/meq	Std. Method 1030F
3	Chloride	26.6	mg/l	EPA 9252
	pH	7.3		EPA 9040
	Specific Conductance	780	µmho/cm	EPA 120.1
	Total Dissolved Solids	505	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	0.02	mg/l	EPA 6010

Laboratory Representative Signature: Yvonne H. Bestucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93 (SE65)

G WATER MONITORING

Submittal for TDH Permit No. 1062-A Monitoring Well I.D. No. MW-5 (D92-14561-3)
 Purpose of: [] Background Data [] Semiannual/Annual Data ☒ Fourth Year Data
 Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/18/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator [] Consultant [X] Laboratory Personnel []
 Well Purged/Bailed Before Sampling: Yes [X] No [] How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 14.85 ft Elev 528.99 MSL
 How Were Samples Collected: Dedicated pump.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes [X] No []

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	138.	mg/l	EPA 6010
	Magnesium	20.6	mg/l	EPA 6010
	Sodium	112.	mg/l	EPA 6010
	Potassium	0.8	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	729.	mg/l	Std. Method 403
	Sulphate	<1.0	mg/l	EPA 9038
	Fluoride	0.5	mg/l	EPA 340.2
	Nitrate (N)	0.06	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	598.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	418.	mg/l	EPA 130.2
	Anion-Cation Balance	13.4/14.2	meq/meq	Std. Method 1030F
3	Chloride	49.6	mg/l	EPA 9252
	pH	7.0		EPA 9040
	Specific Conductance	1180	µmho/cm	EPA 120.1
	Total Dissolved Solids	720	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	12.4	mg/l	EPA 6010
	Manganese	0.29	mg/l	EPA 6010

Laboratory Representative Signature: *Spina S. Bestwick* Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: *Ken Smith* Date: 2-4-93
 (SE65)

GROUNDWATER MONITORING REPORT

TDH Permit No. 1062-A Monitoring Well I.D. No. MW-6 (D92-14836-1)
 Submittal for ☐ Background Data ☐ Semiannual/Annual Data ☒ Fourth Year Data
 Purpose of: Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 3+voa Sampled by: Reed Engineering Group
 Representing: Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: 9 hours
 No. Well Volumes Purged: 1 Depth to Water Before Bailing: 08.26 ft Elev 466.77 MSL
 How Were Samples Collected: Dedicated pump
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	387.	mg/l	EPA 6010
	Magnesium	83.	mg/l	EPA 6010
	Sodium	480.	mg/l	EPA 6010
	Potassium	5.4	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	513.	mg/l	Std. Method 403
	Sulphate	1640.	mg/l	EPA 9038
	Fluoride	0.5	mg/l	EPA 340.2
	Nitrate (N)	0.28	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	421.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	1430.	mg/l	EPA 130.2
	Anion-Cation Balance	47.6/47.3	meq/meq	Std. Method 1030F
3	Chloride	176.0	mg/l	EPA 9252
	pH	7.0		EPA 9040
	Specific Conductance	3920	µmho/cm	EPA 120.1
	Total Dissolved Solids	3110	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	2.38	mg/l	EPA 6010
	Manganese	1.04	mg/l	EPA 6010

Laboratory Representative Signature: Yonia D. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: (SE65) 2-4-93

G D WATER MONITORING

Submittal for TDH Permit No. 1062-A Monitoring Well I.D. No. MW-7 (D92-14836-2)
 Purpose of: ☐ Background Data ☐ Semiannual/Annual Data ☒ Fourth Year Data
 Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: ☐ Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: Immediately
 No. Well Volumes Purged: 3 Depth to Water Before Bailing: 04.00 ft Elev 472.78 MSL
 How Were Samples Collected: Dedicated pump
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	150.	mg/l	EPA 6010
	Magnesium	8.42	mg/l	EPA 6010
	Sodium	20.0	mg/l	EPA 6010
	Potassium	0.5	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	488.	mg/l	Std. Method 403
	Sulphate	61.	mg/l	EPA 9038
	Fluoride	0.5	mg/l	EPA 340.2
	Nitrate (N)	0.47	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	400.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	410.	mg/l	EPA 130.2
	Anion-Cation Balance	9.63/9.06	meq/meq	Std. Method 1030F
3	Chloride	10.6	mg/l	EPA 9252
	pH	7.1		EPA 9040
	Specific Conductance	800	µmho/cm	EPA 120.1
	Total Dissolved Solids	502	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	<0.01	mg/l	EPA 6010

Laboratory Representative Signature: Monica J. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93
 (SE65)

G W A T E R M O N I T O R I N G

Submittal for TDH Permit No. 1062-A Monitoring Well I.D. No. MW-8A (D92-14836-3)
 Purpose of: ☒ Background Data ☐ Semiannual/Annual Data ☐ Fourth Year Data
 Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: 24 hours
 No. Well Volumes Purged: 1 Depth to Water Before Bailing: 14.66 ft Elev 442.07 MSL
 How Were Samples Collected: Hand pump. Decontamination between wells.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic	<0.01	mg/l	EPA 7062
	Barium	0.11	mg/l	EPA 6010
	Cadmium	<0.005	mg/l	EPA 6010
	Chromium	<0.05	mg/l	EPA 6010
	Copper	<0.01	mg/l	EPA 6010
	Lead	<0.02	mg/l	EPA 6010
	Mercury	<0.001	mg/l	EPA 7470
	Selenium	<0.01	mg/l	EPA 7740
	Silver	<0.01	mg/l	EPA 6010
	Zinc	0.05	mg/l	EPA 6010
2	Calcium	200.	mg/l	EPA 6010
	Magnesium	26.4	mg/l	EPA 6010
	Sodium	148.	mg/l	EPA 6010
	Potassium	1.1	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	850.	mg/l	Std. Method 403
	Sulphate	154.	mg/l	EPA 9038
	Fluoride	0.6	mg/l	EPA 340.2
	Nitrate (N)	0.61	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	697.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	600.	mg/l	EPA 130.2
	Anion-Cation Balance	18.8/18.6	meq/meq	Std. Method 1030F
3	Chloride	54.9	mg/l	EPA 9252
	pH	7.0		EPA 9040
	Specific Conductance	1600	µmho/cm	EPA 120.1
	Total Dissolved Solids	1070	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	0.17	mg/l	EPA 6010

Laboratory Representative Signature: Syonia N. Bestucci Phone: (214) 238-5591
 Laboratory Name: MDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93
 (SE65)

G W A T E R M O N I T O R I N G

TDH Permit No. 1062-A Monitoring Well I.D. No. MW-9 (D92-14836-4)
 Submittal for ☐ Background Data ☐ Semiannual/Annual Data ☒ Fourth Year Data
 Purpose of: Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: 24 hours
 No. Well Volumes Purged: 1 Depth to Water Before Bailing: 05.93 ft Elev 455.00 MSL
 How Were Samples Collected: Hand pump. Decontamination between wells.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	270.	mg/l	EPA 6010
	Magnesium	24.9	mg/l	EPA 6010
	Sodium	65.0	mg/l	EPA 6010
	Potassium	0.9	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	912.	mg/l	Std. Method 403
	Sulphate	147.	mg/l	EPA 9038
	Fluoride	0.4	mg/l	EPA 340.2
	Nitrate (N)	0.08	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	748.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	790.	mg/l	EPA 130.2
	Anion-Cation Balance	19.3/19.1	meq/meq	Std. Method 1030F
3	Chloride	44.3	mg/l	EPA 9252
	pH	6.9		EPA 9040
	Specific Conductance	1520	µmho/cm	EPA 120.1
	Total Dissolved Solids	1050	mg/l	EPA 160.1
	Total Organic Carbon	1.4	mg/l	EPA 9060
	Total Organic Carbon	1.2	mg/l	EPA 9060
	Total Organic Carbon	1.3	mg/l	EPA 9060
	Total Organic Carbon	1.4	mg/l	EPA 9060
4	Iron	9.33	mg/l	EPA 6010
	Manganese	3.31	mg/l	EPA 6010

Laboratory Representative Signature: Syonia A. Blum Phone: (214) 238-5591
 Laboratory Name: MDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Ken Smith Date: 2-4-93
 (SE65)

G D W A T E R M O N I T O R I N G

Submittal for TDH Permit No. 1062-A Monitoring Well I.D. No. MW-10 (D92-14836-5)
 Purpose of: ☐ Background Data ☐ Semiannual/Annual Data ☒ Fourth Year Data
 Groups 1, 2, 3, & 4 Groups 3 & 4 Groups 2, 3, & 4

Date Sampled: 12/29/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
 Representing: ☐ Site Operator ☐ Consultant ☒ Laboratory Personnel ☐
 Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: 24 hours
 No. Well Volumes Purged: 1 Depth to Water Before Bailing: 02.50 ft Elev 457.59 MSL
 How Were Samples Collected: Hand pump. Decontamination between wells.
 Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

GROUP	PARAMETER	LEVEL	UNITS	ANALYSIS METHOD
1	Arsenic		mg/l	EPA 7062
	Barium		mg/l	EPA 6010
	Cadmium		mg/l	EPA 6010
	Chromium		mg/l	EPA 6010
	Copper		mg/l	EPA 6010
	Lead		mg/l	EPA 6010
	Mercury		mg/l	EPA 7470
	Selenium		mg/l	EPA 7740
	Silver		mg/l	EPA 6010
	Zinc		mg/l	EPA 6010
2	Calcium	600.	mg/l	EPA 6010
	Magnesium	126.	mg/l	EPA 6010
	Sodium	1700.	mg/l	EPA 6010
	Potassium	6.7	mg/l	EPA 6010
	Carbonate	<0.1	mg/l	Std. Method 403
	Bicarbonate	844.	mg/l	Std. Method 403
	Sulphate	2730.	mg/l	EPA 9038
	Fluoride	0.5	mg/l	EPA 340.2
	Nitrate (N)	0.13	mg/l	EPA 353.3
	Phenolphthalein Alkalinity (CaCO ₃)	<0.1	mg/l	Std. Method 2320
	Alkalinity (CaCO ₃)	692.	mg/l	EPA 310.1
	Hardness (CaCO ₃)	2050.	mg/l	EPA 130.2
	Anion-Cation Balance	116/115	meq/meq	Std. Method 1030F
3	Chloride	1600.	mg/l	EPA 9252
	pH	7.5		EPA 9040
	Specific Conductance	9590	µmho/cm	EPA 120.1
	Total Dissolved Solids	7850	mg/l	EPA 160.1
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
	Total Organic Carbon	<1.0	mg/l	EPA 9060
4	Iron	<0.05	mg/l	EPA 6010
	Manganese	1.24	mg/l	EPA 6010

Laboratory Representative Signature: Lyonia H. Bertucci Phone: (214) 238-5591
 Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
 Site Operator Signature: Kenneth Smith Date: 2-4-93
 (SE65)

2

Date Sampled: 12/18/92 No. Lt. Bottles Collected: 4+voa Sampled by: Reed Engineering Group
Representing: Site Operator [] Consultant ☒ Laboratory Personnel ☐
Well Purged/Bailed Before Sampling: Yes ☒ No ☐ How Long Before: 24 hours
No. Well Volumes Purged: 1 Depth to Water Before Bailing: 11.27 ft Elev 490.56 MSL
How Were Samples Collected: Dedicated pump
Were sample preservation procedures in accordance with TDH Guidelines: Yes ☒ No ☐

Laboratory Representative Signature: Younis N. Berberian Phone: (214) 238-5591
Laboratory Name: NDRC Laboratories, Inc. Address: 1089 East Collins Blvd. Richardson, TX 75081
Site Operator Signature: Ken Smith Date: 2-4-93
(SE65)

Reference 44

**The Hazardous Ranking System Guidance Manual, Interim
Final, U.S. Environmental Protection Agency,
Appendix A - Sensitive Environments, November, 1992.**

The Hazard Ranking System Guidance Manual

Interim Final

Hazardous Site Evaluation Division
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, DC 20460

circumstances be eligible for HRS purposes, and those that generally not be eligible for HRS purposes.

HIGHLIGHT A-8 COMPARISON OF HRS WETLANDS DEFINITION AND WETLANDS CLASSIFICATION SYSTEM USED FOR NWI MAPS

Wetlands Category on NWI Maps	Eligible as HRS wetlands?		
	Yes ^a	Possibly ^b	Generally Not ^c
<p>None in Site area → Marine System</p> <p>Subtidal</p> <p>Rock Bottom ✓</p> <p>Unconsolidated Bottom ✓</p> <p>Aquatic Bed ✓</p> <p>Reef ✓</p> <p>Intertidal</p> <p>Aquatic Bed ✓</p> <p>Reef ✓</p> <p>Rocky Shore ✓</p> <p>Unconsolidated Shore ✓</p>			
<p>None in Site area → Estuarine System</p> <p>Subtidal</p> <p>Rock Bottom ✓</p> <p>Unconsolidated Bottom ✓</p> <p>Aquatic Bed ✓</p> <p>Reef ✓</p> <p>Intertidal</p> <p>Aquatic Bed ✓</p> <p>Reef ✓</p> <p>Streambed ✓</p> <p>Rocky Shore ✓</p> <p>Unconsolidated Shore ✓</p> <p>Emergent Wetland ✓</p> <p>Scrub-Shrub Wetland ✓</p> <p>Forested Wetland ✓</p>			
<p>Palustrine System</p> <p>Rock Bottom ✓</p> <p>Unconsolidated Bottom ✓</p> <p>Aquatic Bed ✓</p> <p>Unconsolidated Shore ✓</p> <p>None in Site area → Moss-Lichen Wetland ✓</p> <p>Emergent Wetland ✓</p> <p>Scrub-Shrub Wetland ✓</p> <p>Forested Wetland ✓</p>			

^a Can be presumed to meet the 40 CFR 230.3 definition of a wetland.

^b May meet the 40 CFR 230.3 definition of a wetland if emergent hydrophytes are present.

^c Generally will not meet the 40 CFR 230.3 definition of a wetland, except for some unique types of wetlands (e.g., some shoals or reefs).

(continued on next page)

HIGHLIGHT A-8 (continued)
COMPARISON OF HRS WETLANDS DEFINITION AND WETLANDS
CLASSIFICATION SYSTEM USED FOR NWI MAPS

Wetlands Category on NWI Map	Eligible as HRS wetlands?		
	Yes ^a	Possibly ^b	Generally Not ^c
Riverine System			
Tidal			
Rock Bottom			✓
Unconsolidated Bottom			✓
Aquatic Bed			✓
Streambed		✓	
Rocky Shore		✓	
Unconsolidated Shore		✓	
Emergent Wetland	✓		
Lower Perennial			
Rock Bottom			✓
Unconsolidated Bottom			✓
Aquatic Bed			✓
Rocky Shore		✓	
Unconsolidated Shore		✓	
Emergent Wetland	✓		
Upper Perennial			
Rock Bottom			✓
Unconsolidated Bottom			✓
Aquatic Bed			✓
Rocky Shore		✓	
Unconsolidated Shore		✓	
Intermittent			
Stream Bed		✓	
Lacustrine System			
Limnetic			
Rock Bottom			✓
Unconsolidated Bottom			✓
Aquatic Bed			✓
Littoral			
Rock Bottom			✓
Unconsolidated Bottom			✓
Aquatic Bed			✓
Rocky Shore		✓	
Unconsolidated Shore		✓	
Emergent Wetland	✓		

^a Can be presumed to meet the 40 CFR 230.3 definition of a wetland.

^b May meet the 40 CFR 230.3 definition of a wetland if emergent hydrophytes are present.

^c Generally will not meet the 40 CFR 230.3 definition of a wetland, except for some unique types of wetlands (e.g., some shoals or reefs).